

Original Articles.

A CIVIL SURGEON "ON TOUR" IN UPPER BURMA.

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To my mind one of the chief charms of an up-country civil surgeoncy is the District touring.

To get away from the routine of headquarters, to be free for a few days to arrange one's own work, and combine it judiciously with a little play, refreshes both mind and body, keeping away that staleness which is so apt to set in when one is tied down to a particular place and routine.

Consequently when there is no urgent work at headquarters, a tour is, so to speak, indicated.

Branch hospitals must be inspected, outbreaks of epidemic disease investigated and, if possible, stamped out, registration of vital statistics enquired into, and the work of the vaccinators tested to prevent fraud. It is so very easy to successfully vaccinate a number of imaginary children, that not infrequently the vaccinator succumbs to the temptation.

Some people have been heard to assert that a wonderful quickening of the civil surgeon's interest in vaccination takes place when the snipe season begins. Ribald men have even talked about "going on tour" to vaccinate the snipe," but this of course is a base and groundless calumny.

Touring in Burma is a much less elaborate business than in India.

No one ever uses tents, and a small army of servants is unnecessary. In many places there are Government bungalows for the use of officials on tour, and where these do not exist, there is always a "zayat," in which one can put up.

Every village and "phongyi kyoung," or monastery, has one or more zayats for the accommodation of travellers,—generally wooden structures with a roof and floor, the latter raised two to four feet above the ground. Sometimes the building is partially closed in, but frequently quite open.

The village "Thugyi," or Headman, brings curtains to hang round the zayat and screen off a bathroom, also mats or rugs for the floor. With a camp-bed, table and chair this temporary residence is complete and quite comfortable. The village maidens bring pots of water, bundles of firewood, grass, straw, etc., and the ponies,—for most of the touring is done on horse-back,—are tied up under a neighbouring tree.

The ordinary establishment for touring is a couple of Burman "loogalays," or boys, and one or more syces depending on the number of ponies required; and the usual procedure is for one loogalay to start after dinner in a bullock-cart and travel during the night to the next halting place, 10 to 20 miles distant. There, everything is prepared for the reception of the hungry, thirsty Civil Surgeon, who will probably arrive before noon.

The other loogalay remains behind to prepare *chota hazri*, and as soon as the Civil Surgeon has started, packs up the remainder of the kit and follows to the next camp.

At dawn the Civil Surgeon is in the saddle and the day's work begins. The task before him is to visit half a dozen or so villages, gradually working round to the next halting place.

The country varies, stretches of cultivated land alternating with undulating ground covered with sparse scrub, or heavily timbered forest pierced with innumerable and confusing tracks. One catches glimpses of the wild life of the jungle, mostly feathered game and the smaller varieties of deer, occasionally a "thamin" or, more rarely, a sambhur. The larger game is seldom seen, though in some districts wild elephants have to be avoided. The only dangerous animal likely to be met with is the half-wild water-buffalo,—a vindictive brute, with an undying hatred of Europeans. If you meet him on foot and alone when he happens to be in a bad temper, I recommend the nearest tree. If mounted, you are generally, though not always, in better case. Once when riding through some low scrub jungle, I was suddenly charged by one of these gigantic brutes, and promptly fled, but the going was so bad that I could not get away fast enough, for the buffalo came through the scrub as if it had been meadow grass and at a pace that astounded me. Fortunately I was training the pony for polo and carrying a stick to get him accustomed to it. When the buffalo came within range, I succeeded in landing several very hard backhanders on his nose, and eventually he desisted, but it was a close shave.

If circumstances compel you to interview a water-buffalo, better, far better, than either tree or pony or polo-stick is a Burmese child. Its age does not matter, anything old enough to stand upright will answer the purpose. Clothed in a grin and armed with a twig, the brat marches up to one of these truculent monsters, calls it names, smacks it on the nose, orders it to clear out, and simply puts the fear of God into it. You are perfectly safe in company with a Burmese infant, but the ignominy of your position, as a representative of the ruling race, bites into your very soul.

The first village is soon reached, a jumble of houses built of wood or bamboo, surrounded by

a high thorn or prickly-pear hedges, with one or more wooden gates, which are closed at night. If improved housing is an indication of increased material prosperity, there is no doubt that a great advance has taken place during the last quarter of a century. The houses are larger, built of better material, and contain more furniture than formerly. The life of a Burmese house is not generally a long one, and as the older houses fall into disrepair, they are replaced by greatly improved structures.

The Civil Surgeon rides up to the Thugyi's house, a table and chair are brought out, and the birth, death, vaccination and other registers produced for inspection. If any vaccination has lately been performed, the children are collected and the truth or otherwise of the vaccinator's entries verified.

Unless in the presence of a small-pox epidemic, the attitude of the people towards vaccination is generally apathetic. There are no conscientious objectors, but no one wants to take the trouble. Perhaps also there is that inherited distrust of all Government action, which is so characteristic of the Asiatic.

In the presence of an epidemic, the apathy quickly vanishes, but even apart from this, one sometimes hears outspoken acknowledgment of the benefits of vaccination. Once, while shooting in an out-of-the-way part of the country, I was sitting in company with the village Thugyi, waiting for heaters. A man came towards us walking in the characteristic manner of the blind. In answer to my enquiry, the Thugyi told me the man had lost his sight from small-pox when a child, and that formerly such cases were very common, but now, since the Government had introduced vaccination, there were no more blinded children, and he added emphatically,—"Vaccination is the best thing your Government has given us." This happened many years ago, before the annexation had become merely a dim and distant memory, and the Thugyi had spent most of his life under the Burmese régime. I was not there in any official capacity and he did not even know my profession, so I think the testimony was unbiassed. The time is surely more than ripe for the extension of the Vaccination Act to rural communities. It would meet with no opposition, but be accepted as death and taxes are accepted, though no one likes either.

The Burmans as a race are so irresponsible, so utterly lacking in foresight, such a Peter Pan amongst nations, that the very success of vaccination increases the difficulty of carrying it out voluntarily.

The longer a district has been free from small-pox, the greater the reluctance to be vaccinated.

The people have the same claim for protection by its rulers, as a child has by its parents, and for

the same reason, not once but many times, headmen have told me that there was no need for vaccination in their villages, "because there had been no small-pox for several years." You cannot deal with a topsy-turvy mentality like this on any voluntary basis.

The birth register is next examined. It is never a complete record of "domestic occurrences," for the names of children who die young are rarely entered. What is the use, argues the Burman, of taking all that trouble about infants who only live a few days or weeks?

The official birth-rate, about 35, is consequently far below the real one, which I believe is over 50 per thousand. The rule that a high birth-rate is always co-existent with a high infantile death-rate, holds good here, for probably over 300 out of every thousand children die in the first year of life.

Yet in spite of this, the village swarms with fat brown babies, jolly little beggars, as free of care as they are of clothes.

It is the women who really pay the toll, and a heavy one it is, for this swarming childhood.

At one time I carried out an investigation, extending over several years and involving enquiry into the deaths of several thousand women between the ages of 15 and 50, and as a result became convinced that between 30 and 40 per cent. of all the women who die between those ages, die from causes directly or indirectly due to childbirth.

I could make no attempt to estimate the chronic ill-health and suffering due to the same cause, but it must be enormous.

This never-ending tragedy, for it is nothing else, is chiefly due to ignorant and barbarous customs, handed down from past ages, and can only be removed by the slow spread of knowledge.

Once, when on tour, several Burmans came to me late one evening and asked me to go to a village a couple of miles away to see a woman who had been in labour for three days. I accompanied them, but on arrival at the village we were greeted with the news that the child had been born. I enquired how it had been managed, and they replied, pointing to a heavy fat man, whose face wore a self-satisfied grin,—"We got him to jump up and down on the woman's belly." I saw the wretched victim, who was in a state of collapse, and suggested that I should examine and see if I could do anything for her. But no! they were so pleased with their success that they preferred to continue their own methods. The child was alive and the head showed no signs of excessive pressure, so the case may have been merely one of uterine inertia, which appropriate treatment could have remedied. The ill-used woman died during the night.

To prevent such things in the future, a beginning has been made by the appointment of

out-door maternity nurses, trained at the Dufferin Hospital, Rangoon, to some of the larger towns and villages. These do good work, but they are so few, perhaps two or three in a whole district, that they only touch the fringe of the evil.

The perusal of death registers may not appear to be a very interesting occupation, but occasionally one stumbles across something beyond the ken even of the Royal College of Physicians.

One curious cause of death called "Pengoo Na," or Spider Sore, attracted my attention. I collected 50 cases spread over three years in one district.

The sore or disease is said to be due to the bite of a tiny spider, and is quite unknown in towns. I managed after much difficulty to procure a couple of alleged specimens, which were about one-half the size of a small black ant, and sent them to the British Museum for identification. In reply the writer gave the name and classification of the insect, but added that it had never been credited with the poisonous powers described by me. Unfortunately this letter, with most of the papers I possessed, was sent to the bottom by a German submarine, and I cannot remember the insect's name or classification.

The villagers have no doubt whatever about its poisonous powers, and say that, although healthy adults frequently recover, weakly and old or very young people invariably die.

I have seen two cases—one alive, the other dead. The former, a sturdy girl of 19, had been bitten on the cheek three weeks previously and was well on the way to recovery.

There were two deep gangrenous ulcers, each about the size of a four-anna piece, on the cheek, while the surrounding tissues were brawny and pitted with small sinuses, from which pus was oozing. The part had been enormously swollen (though this had subsided), and evidently the seat of intense septic inflammation. The girl said she did not know she had been bitten, until the cheek became swollen and painful.

Some villagers say that the bite does not develop until some oil touches it; others that water has a similar effect. As the Burmans use oil largely both in cooking, and dressing their long hair, while in their persons they are very clean, it is easy to understand that either of these conditions is almost certain to be present, but I am unable to frame any theory to account for this belief.

The second case was that of a frail elderly woman who had been bitten the previous day and died on the morning of my arrival. There was a small bluish puncture near one of the lower eyelids, which was slightly swollen, but no other visible lesion.

In this case the intensity of the poison was apparently sufficient to cause death before any local reaction could set in. If, as the villagers allege, a tiny insect possesses such tremendous

power, one can only be thankful that it is not more common and more widely distributed.

Village sanitation is almost as thorny a subject as the village fence, which latter, from the point of view of the former, is an unmitigated evil. The soil of the enclosed area is fouled by generation after generation of human beings, cattle, dogs, etc., and is only occasionally purified by fires, which sometimes wipe out a whole village. Small wonder, then, that there is a plague of flies and other potential disease-carriers.

A great step forward would be the stabling of all village cattle in one location, instead of having them dispersed throughout the village, frequently underneath the houses. The state in which many of these cattle are kept is indescribable. At night they are penned up in enclosures often more than knee-deep in semi-liquid filth. All animals suffer, while not infrequently young and weakly calves die from suffocation when no longer able to stand upright. From an economic point of view the loss must be enormous.

A single large pen, with the headman responsible that it is kept in reasonable sanitary condition, would do much to improve matters.

Occasionally the Thugyi will consult the Civil Surgeon about digging a new, or repairing an old, well. This is not a tribute to one's sanitary knowledge, as you might perhaps think, but a shrewd move to obtain a recommendation for a grant from District Funds, for the Burman much prefers to spend his own money on building useless pagodas than on works of public utility.

But time is getting on, so mounting once more the Civil Surgeon makes for his next objective.

Perhaps this is a village attacked by one of the three dreaded scourges of rural life,—plague, cholera, or small-pox.

When plague first came to this country, and for several years afterwards, desperate attempts were made to prevent its spread and stamp it out by surveillance, segregation, disinfection, evacuation, inoculation, rat-killing, etc. I fear it must be admitted that our efforts were not only futile, but probably did more harm than good, except in one direction—evacuation. This is really the sheet-anchor of rural communities infected or threatened with plague, and is also the one method that from the beginning excited no distrust or dislike. The people rapidly became convinced of its advantages, and soon began to resort to it of their own accord.

Inoculation would no doubt be a most valuable aid if only the people could be persuaded to accept it, but with few exceptions they remain hostile. This hostility is not, I believe, due to the slight pain and fever following inoculation, but to the fact that immunity is neither complete nor permanent. A single case of plague amongst the inoculated is sufficient to damn the operation in the eyes of the villagers, though you

may prove to them that there were 50 cases amongst the uninoculated for every one case amongst the inoculated.

Occasionally some dramatic incident will cause a revulsion in its favour, but this is rare.

In one plague-infected village I inoculated four out of five residents in one house; a week afterwards the uninoculated man took plague and died, the other four escaped. A deputation, headed by the Thugyi, came to headquarters and asked me to return and inoculate the whole village. This I did, and the epidemic stopped at once.

Cholera is somewhat of a problem, but fortunately bad outbreaks are not very common. Occasionally it can be traced to an infected well, and the closure of this is followed by a rapid, sometimes an instantaneous, stoppage of the disease. Frequently, however, the cause baffles all attempts to discover it. I believe a good many isolated outbreaks of cholera (so called) are due to ptomaine poisoning, from eating decayed or diseased meat. I have many times traced attacks to this cause. The Burman, though he prefers good, will eat diseased or decayed meat rather than none.

Outbreaks of small-pox are dealt with by segregating those attacked in huts outside the village, and vaccinating all who can be induced to submit to the operation.

At one time a large number of outbreaks of small-pox were due to inoculation, but of late years this practice has diminished.

I believe one of the causes of the former popularity of inoculation was the absence, in the majority of cases, of any troublesome symptoms, such as sometimes follow vaccination, especially under insanitary conditions.

The child may of course develop generalized small-pox and die; this risk is clearly recognized, but accepted, because in the majority of cases the after-effects are almost nil. A small pox, with perhaps a few still smaller ones around it, is the usual course of an inoculation, and the children require little, if any, attention. That the inoculated child may spread infection and give rise to a severe epidemic of small-pox, is either not recognized, or else considered outside the sphere of human action and fittingly left in the hands of Providence.

The improvement in the purity of the vaccine lymph, due largely to the replacement of lanoline by glycerine, has brought vaccination more on a par with inoculation as regards local effects, for the severe inflammation formerly common after vaccination is now rarely seen.

Riding from village to village the morning rapidly passes away until camp is reached, in a phongyi kyoung, on the outskirts of a village. Bath, breakfast and a siesta occupy the time until the afternoon's work begins. This may be a

repetition of the morning round, starting out at 3 p.m. and returning at nightfall, or perhaps there is a branch hospital to be inspected.

This, I confess, is one of the least enjoyable duties while on tour. Equipment, records, etc., have to be gone through, and conundrums, which would sometimes not be out of place amongst the "Hard Cases" in *Truth*, settled.

The Sub-Assistant Surgeons in charge of these institutions lead professionally rather isolated lives, but in spite of this handicap the slackers are few, while some are extraordinarily keen and energetic. Still I think they should more frequently be given a turn of duty in some large hospital to brush up their knowledge.

But every afternoon is not occupied in the pursuit of work. Perhaps there is a *jhil* not far away where a pleasant and profitable time can be spent after duck and snipe, the bag forming an agreeable addition to the daily menu.

The ordinary Burman villager does not appreciate the attractions of shooting except for the "pot."

Sitting down to rest on one occasion while out snipe-shooting, a friendly old Burman came up and entered into conversation.

Picking up a snipe he remarked that it was a very small bird, and enquired the price of a cartridge. I replied about two annas. After some mental arithmetic he announced that I could buy a chicken for four annas, and there was a great deal more eating on one chicken than on two snipe, not to mention the time and trouble in getting the latter. He evidently thought I was rather a fool to buy cartridges instead of chickens. I had not the courage to tell him that sometimes a snipe cost several cartridges,—he would have regarded me as a lunatic. Walking back to camp after flight-shooting, one night, I saw a weird and interesting phase of jungle life. The path led through some heavily timbered country, with here and there open grassy glades. Coming suddenly on one of these open spaces, I stopped motionless, in the shadow of a large tree, at the sight that confronted me.

On the open grass, lit up by the moonlight, some 15 or 20 hares were holding high revelry, standing on their heads, turning somersaults, performing the wildest antics, all as quaint and weird as ever a writer of fairy tales conjured from his imagination. I watched them fascinated, and scarcely daring to breathe, for probably a minute. Then like a flash they vanished, nothing remained but the bare moonlit grass,—the revellers had disappeared as swiftly and silently as the fairies are said to do.

In most villages there is a "mokso," or shikari, who knows where game is to be found. The calling is not a very reputable one, for it is against Buddhist principles to take life in any form, and the mokso is, by all accounts,

doomed to a very thin time in the next world. This, however, does not appear to affect his enjoyment of the good things of the present life, and in their way many of these men are "characters," frequently "bad" I admit.

I have very kindly recollections of one old mokso, to whom I've been indebted for many good days.

Before starting for a shoot, a certain formula was always gone through. The mokso explained that the "nat," or spirit, which ruled this jungle, was a bad-tempered, cantankerous fellow, whose good will could only be purchased by the presentation of a bottle of beer. If no beer was forthcoming, we might as well stay at home, for the nat would warn all the animals in the jungle. The appeal was irresistible and a bottle of beer was quickly transferred to the mokso's haversack.

On arrival at the shooting ground, he selected a tree in which he announced the nat lived. The beer was then opened and a drop or two sprinkled on the tree to the accompaniment of a mumbled prayer. The beer was recorked, returned to his haversack, and never touched until the shoot was over. If successful a few tiny pieces, snipped off the hoofs, ears and muzzle, were presented on a leaf to the nat, as his share of the bag. Having now, as he considered, done his duty, the old gentleman would sit down, reopen the beer and drink it to the last drop, with an appreciation that was a perfect delight to behold.

There is much joy in the village after a successful shoot. Every man, woman and child turns out to view and get a share of the spoil, for though a Burman Buddhist will not risk his soul's salvation by taking life, he is quite ready to enjoy the proceeds of another's sin. It is the man who kills, not the man who eats the "kill," that must pay the penalty. Besides, what does it matter about a thekin's (sahib's) soul,—probably he has not got one at all! only! So the crowd sits round laughing and chattering while the meat is cut up by enthusiastic volunteers.

It is interesting to watch the faces of the people, for though there is a fairly well established Burman type of face, one often sees startling contrasts, even in remote villages where alien blood would be least expected. I've seen two men side by side,—one, whose face might have been that of a sunburnt Irish peasant, the other, that of a Krooman from the Gold Coast.

Very noticeable is the number of old men one sees with that saintly, ascetic, refined type of face, usually associated with some high church dignitary. These men were born and brought up under the old Burmese régime, and it will be interesting to see if the present generation, born and brought up under British rule, will, when it reaches old age, show similar characteristics.

At last the day's occupations are over and the Civil Surgeon is back in camp. Dinner is not long delayed for the jungle folk keep early hours.

Gradually the noises of the day die away, and silence reigns, broken only by the tinkling of the bells on the pagoda as they sway in the breeze. The kyoung with its fantastic, carved roof, tawdry and dilapidated by day, stands out a vision of beauty and mystery in the clear moonlight. The spell of the scene grips one, and with it comes the reflection that there are worse places in the world than Upper Burma.

ANALYSIS OF 1,200 CONSECUTIVE ABDOMINAL OPERATIONS PERFORMED FOR GYNÆCOLOGICAL DISEASE ON BURMESE FEMALES.

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THE following is an analysis of twelve hundred consecutive abdominal operations performed during the last eight years for gynæcological disease on Burmese female patients of Burma under my charge at the Rangoon General Hospital.

The analysis has been undertaken with a view to enquiring if Burmese women, possibly by the influence of a hot climate and different mode of livelihood, vary materially in diseases peculiar to their sex from females living in a temperate zone like England.

The following is a list of the various gynæcological operations performed :

TABLE A.

Operations.	Total.	Deaths.	Per cent.
Ovariectomy ...	237	8	3
Salpingo-oophorectomy for tubal disease ...	431	23	5.5
Salpingo-oophorectomy for extra uterine pregnancy ...	54	2	4
Hysterectomy for fibroids ...	199	3	1.5
Hysterectomy for carcinoma ...	47	9	19
Cæsarian section ...	13	2	20
Myomectomy ...	7	...	...
Hysteroplexy ...	145	...	...
Laparotomy exploratory ...	29	5	17
Laparotomy for peritonitis of pelvic origin ...	24	4	18
Miscellaneous ...	14	2	14
TOTAL ...	1,200	58	5

The percentage of mortality attending these operations is no doubt high when compared with similar results obtained in English hospitals, but it must be remembered the large majority of the operations were performed for neglected disease. Surgery, as practised by western methods, is still, so to speak, on probation in Burma, and though the inhabitants of the larger towns have

gained some confidence, and are rapidly gaining more, those of the small towns and villages remain adverse to anything but the slightest surgical measures. Abdominal operations are therefore viewed with great apprehension, and as a rule not submitted to till a long course of medicinal native treatment has proved unavailing, or until pain and ill-health have become so accute as to destroy all joy in living.

Up till some eight years ago when the palatial New General Hospital was opened in Rangoon, no serious effort had been made to deal with gynaecological diseases; since that date, however, a special Gynaecological Department has been opened, and a steady growing practice established. As confidence in this department has increased, patients have presented themselves in less obviously advanced stages of disease, but, for the present and for some long time yet to come, it must be expected that the large majority of the patients will attend with diseases of long duration. The Burmese woman differs greatly from the women of India, being allied to the Mongolian race, and though resembling in many characteristics the Japanese female, she is of a taller build and of a weaker physical development. Unhampered by any of the caste prejudices so common in India that prevents a female mixing with the society of men, the Burmese woman is still of distinctly feminine attributes, and amongst them timidity and fear of pain are well marked. In consequence she has at first a great dread of hospitals which, along with other more civilized races, she associates closely with operations of a cutting nature; once, however, confidence is established the Burmese woman reposes a trust in the surgeon which is at times embarrassing, since she often invests him with superhuman powers of effecting a cure.

As a patient, the Burmese woman behaves excellently, she is of a bright and grateful disposition, and her habits are cleanly and pleasing; oral sepsis is very rare, and alcohol drinking practically unknown.

With regard to gynaecological functions, menstruation usually commences about the age of 14-15 years, the period lasts about 4-5 days and is in no way excessive. Nearly every Burmese woman marries, for the most part at the age of 18-20 years, and being of a fruitful race large families are common. The menopause usually occurs about the age of 47-50 years and is unaccompanied as a rule by any nervous disturbance.

As regards diseases peculiar to their sex, it appears to me that Burmese females suffer from no special liability, nor enjoy any special immunity, and that their ailments behave in a very similar manner to those of women in more temperate climates under more civilized conditions of life. In the accompanying table of operations the

relative frequency of particular operations does no doubt vary from a similar list of consecutive operations at a large English hospital, but such variations are mainly due to the fact that the practice of gynaecology is at present in its infancy in Burma. Thus, until greater confidence has been established in Western methods of treatment, the greater proportion of the patients will present themselves with diseases in their acute stage, or if suffering from tumours with the growths so far advanced in size as to produce great discomfort. To make this point clear I would mention that at the commencement of the period over which this series of operations extend, hysterectomies for uterine fibroids were few and far between, whilst practically every case of cancer of the cervix was too hopelessly advanced to admit of any operation. Hysterectomies for fibroids are now, however, being performed with increasing frequency, and will become, I believe, one of our commonest abdominal operations, whilst it is also now possible to select a small but increasing number of cases of cancer of the cervix as being fit for effective removal. Any list, then, of operation does no more at present than notify the occurrence of the various forms of gynaecological disease, and cannot be considered as a record of their relative frequency.

As mentioned before, the percentage mortality of the various operations does not compare favourably with those obtainable amongst a more civilized community, but the debilitated condition of many of the patients and the advanced stage of their disease have had much to do with this result,—a state of affairs which is further aggravated by the necessity of operating without any delay. Any pre-operative rest in bed is as a rule unobtainable, for on admission into hospital the Burmese woman is very timid, quite ignorant of hospital routine, and so suspicious; most frequently she has with difficulty made up her mind to enter hospital, and more often than not in the face of repeated protestations from her relations and friends. Though she has thus screwed up her courage to the sticking point, even when in an hospital ward any delay in performing the necessary operation, or any fright from the sight of some suffering patient, will dissipate her good resolutions and she will pack up her bundle to depart and return no more. Numerous instances of such behaviour prevent the insistence of any pre-operative treatment however desirable, and the great majority of the patients are operated on within a day or so of their admission.

Ovariectomy.—237 Ovarian cysts were operated on with 8 deaths.

The age of the patients operated on varied from 17 to 71 years. Only 8 per cent. of the patients operated on for ovarian cysts were unmarried, a percentage considerably smaller than with white races; very few Burmese women, however, remain

TABLE B.

Showing the ages of patients in the different operation groups.

AGE.	Ovariectomy.		Tubal disease.		Tubal pregnancy.		Myomectomy.		Hysterectomy for fibroids.		Carcinoma of cervix.		Hysteroplexy.		Exploratory laparotomy.		General peritonitis.		Miscellaneous.		Caesarian section.		TOTAL.	
	Cases.	Per cent.	Cases.	Per cent.	Cases.	Per cent.	Cases.	Per cent.	Cases.	Per cent.	Cases.	Per cent.	Cases.	Per cent.	Cases.	Per cent.	Cases.	Per cent.	Cases.	Per cent.	Cases.	Per cent.	Cases.	Per cent.
Under 20	11	5	8	2	2	4	...	...	...	...	...	...	11	7	...	...	...	...	...	...	...	...	32	3
20-29	58	24	220	51	16	30	4	60	2	1	...	...	48	33	1	3	11	46	2	28	1	7	363	31
30-39	83	35	151	35	33	61	3	40	64	33	11	23	54	39	10	35	13	54	9	50	5	39	436	36
40-49	61	26	49	11	3	5	...	...	94	47	22	47	23	15	16	55	...	...	3	22	6	47	277	23
50-59	22	9	3	1	...	...	...	...	31	15	12	25	6	4	2	7	...	...	...	...	1	7	77	6
60 and over	2	1	...	...	...	...	...	...	8	4	2	5	3	2	...	...	...	...	...	...	...	...	15	1
TOTAL	237	100	431	100	54	100	7	100	199	100	47	100	145	100	29	100	24	110	14	100	13	100	1,200	100

Gynæcological operations.

OPERATIONS.	Number of cases.	AGE.														RESULTS.	
		5		10		20		30		40		50		60			
		Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.
<i>Ovariectomy.</i>																	
For cysts ...	226	...	...	9	1	56	...	77	2	56	3	19	1	2	...	219	7
For solid growths	11	...	...	1	...	2	...	4	...	2	...	1	1	...	...	10	1
TOTAL ...	237		...	10	1	58	...	81	2	58	3	20	2	2	...	229	8

unmarried, and the fact that 55 per cent. of the patients had never been pregnant goes to show there was no real difference in the relationship of ovarian cysts to sterility. The menstrual function in the large majority of the patients showed no deviation from the normal.

Every kind of ovarian cyst was met with, the proportion being:—

Proliferating multilocular cysts	...	83 per cent.
Papilliferous cysts	...	4 "
Dermoid cysts	...	7 "
Parovarian cysts	...	6 "

These proportions seem very similar to those I have been able to obtain for white races. Many of the tumours were very large, measurements of 50 inches being obtained of the girth of the abdomen taken round the umbilicus. Quite a proportion of the patients suffered from marked dyspnoea with œdema of the lower extremities.

With such cases the administration of an anæsthetic was a serious consideration and one patient died on the operation table from the effects of the anæsthetic. Chloroform was the anæsthetic invariably used; at one time an attempt was made to substitute spinal anæsthesia, but the patients objected so strongly to being conscious whilst the operation was in progress, that the method was abandoned. If the dyspnoea was so acute as to prevent the patients lying down, a partial withdrawal of the fluid contents by tapping was attempted on the day previous to operation, and when successful, undoubtedly rendered the administration of the anæsthesia safer, otherwise all cysts were removed entire. The incision necessary at times reached from the ensiform appendix to the pubes, and though lengthy, invariably healed without trouble, and, as far as could be ascertained, with no greater tendency

to ventral hernia than smaller incisions. The presence of complicating adhesions was frequent, due largely to previous violent massage of the abdomen. Burmans are staunch believers in the efficiency of massage, and nearly every patient had undergone a course of violent and prolonged massage of the abdomen in the hopes of "dispersing" the tumour.

As to the actual duration of the cysts or their rate of growth the patients' histories varied greatly, and no reliable information could be gathered, though there was no doubt certain cysts after considerable periods of quiescence had taken on a rapid growth. One woman of 30 years operated on for an ovarian dermoid, stated she had had the tumour from childbirth. The cyst was very large, completely filling the abdomen and everting the lower ribs in an extraordinary manner; it contained three pieces of bone each the shape and size of an adult scapula and studded with teeth, and also an enormous amount of hair. It was noted with all the dermoid cysts that the hair contained in them was the same colour as that of the patient, *i.e.*, a jet black.

With some of the large parovarian cysts the peritoneum was so extensively stripped up as to render the rectum and sigmoid flexure apparently sessile on the cyst wall—a condition at first perplexing, and one which complicated the operation.

Of the accidents that ovarian cysts are liable to, the following conditions were met with:—

Twisted pedicle	...	...	6 cases.
Suppuration	...	...	4 "
Rupture of cyst	...	...	2 "

One case of complete detachment of the pedicle was operated on, this detachment had evidently taken place by slow torsion, during which process the cyst had formed dense and vascular adhesions to the under-surface of the liver by which it continued to be partially

nourished. The severed pedicle and the lower part of the cyst were extensively impregnated with calcareous salts, and the cyst by acting somewhat as a foreign body had produced considerable ascites. The woman was aged 47 years, and had noticed the tumour for 11 years; after removal of the tumour the ascites disappeared and did not return. Of the ruptured cysts, one had been ruptured by forcible massage, the other had burst spontaneously.

Two cases of ovarian cyst complicating pregnancy were operated on. Both patients were in the eighth month of their pregnancy and the cysts being large the abdomens were enormously distended. In one case labour came on within 24 hours of the operation, the other case went to term. Both women made good recoveries, and both children lived, being well-formed and healthy.

Of eleven solid tumours of the ovary operated on, six were sarcomata and five fibromata; two of the former and two of the latter had accompanying well-marked ascites; in fact it was for this condition the patients sought relief. Ten patients recovered and one, a case of sarcoma in a very poor state of health, died. In one case of sarcoma, both ovaries were affected, the growths being of about equal size, *i.e.*, that of a cricket ball. One case of fibroid of the ovary was interesting on account of the calcification of the growth, it occurred in a patient aged forty years, and the tumour being the size of a croquet ball, of stony hardness and very movable, gave the impression of a cannon ball loose in the abdomen. The growth was removed with great ease and found to consist of fibroid tissue, so impregnated with calcium salts that it could not be cut with a knife. At one point a thin layer of atrophied ovarian tissue could be made out microscopically. The sarcomata were removed from patients either under twenty-five or over forty years, the fibroids of all occurred between the ages of 30-40 years.

Gynaecological operations.

OPERATIONS.	Number of cases.	AGE.												RESULTS.			
		5		10		20		30		40		50		60		Discharged.	Died.
		Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.		
Salpingo-öophorectomy— For hydro-salpinx	6	...	...	...	...	...	...	3	...	3	...	...	...	...	...	6	...
" pyosalpinx	150	...	...	7	1	120	3	13	1	5	...	...	...	...	...	145	5
" acute salpingitis	3	...	...	...	...	1	1	...	1	...	...	...	...	...	...	1	2
" chronic salpingitis	67	...	...	...	...	14	...	45	...	8	...	...	...	...	...	67	...
Salpingo-öophorectomy— With amputation of part or whole of body of uterus for double pyosal- pinx	205	...	...	...	...	77	4	79	9	30	3	3	...	...	...	189	16
TOTAL	431	...	...	7	1	212	8	140	11	46	3	3	...	...	...	408	23

Operations for pyosalpinx were performed with exceptional frequency, this frequency being due to the great prevalence of venereal disease in Rangoon city and its neglect of treatment. On a consideration of the history-tickets the opinion has been formed that quite 90 per cent. of the cases were of gonorrhoeal origin. In 69 per cent. the pyosalpinx was bilateral. In 56 per cent. of the cases of pyosalpinx operated on, a partial or complete removal of the body of the uterus was also carried out. The mortality attending the operations worked out at slightly under 6 per cent. The youngest patient was aged 16, the eldest 52 years. Forty-five per cent. of the patients were between the ages of 20 and 30 years. It would at first sight seem that operations for pyosalpinx had been performed with undue frequency, and that the beneficial results of prolonged rest had not been given a sufficient trial. Unfortunately native patients almost invariably refuse to submit to any such prolonged form of treatment owing to family reasons of considerable weight, and if a cure is to be attempted it must, in the large majority of the patients, be by operative measures. Another impression that might be gained is that Burmese women were of an excessively immoral tendency; this is incorrect. Though a small proportion of the patients were prostitutes the great majority were respectable women who had been infected by their husbands,—a result due to the irresponsible nature of the Burmese males, and to their ignorance in believing they are cured of gonorrhoea as soon as the acute symptoms have passed off. The operations were found to be by far the most difficult of all the gynæcological surgery performed, the contents of the pelvis being often welded into a solid mass roofed over with adherent intestine, the whole tumour extending as high as the umbilicus.

In cases of double pyosalpinx where both ovaries were hopelessly disorganized and incorporated into the pus cavity, a supra-vaginal hysterectomy was also performed. This proceeding greatly simplified the operation.

In cases of a smaller nature where one ovary, or a portion of an ovary, appeared still capable of performing its function, a partial amputation of the fundus of the uterus was substituted for a supra-vaginal hysterectomy.

I am strongly of opinion that an operation for the relief of double pyosalpinx is, as a rule, unsuccessful as regards future relief from pain and discomfort, if the whole of the infected uterus is left behind. The removal of both the pus-distended tubes plus a supra-vaginal hysterectomy, or an amputation of the fundus of the uterus, has in my experience rendered by far the most satisfactory results. Theoretically a supra-vaginal or pan-hysterectomy is preferable with the view of obtaining a complete cure, but there are many objections to abolishing the

menstrual function especially in quite young women. Apart from anything else, the native female attaches the greatest importance to the menstrual function, and is greatly opposed to its entire abolition. In cases where the ovaries were not entirely disorganized, and the fundus of the uterus only was removed, the operation was not followed by complete cessation of menstruation, though as a rule the function was greatly diminished. The menstruation often only amounted to a scanty one-day flow, but this was as a rule sufficient to satisfy the patient's mind.

It was, on the other hand, of great interest to note how little real disturbance accompanied the production of an artificial menopause in quite young women, when the extent of the disease enforced a clear sweep of the disorganized pelvic organs, ovaries, tubes and uterus.

I firmly believe that incomplete operations for pyosalpinx are often the cause of much after-ill-health, in short the patient is not cured; on the other hand the after-results of removal of double pyosalpinx plus a partial hysterectomy have, as a rule, been excellent. No hard and fast rule can be laid down, each case must be judged on its individual merits. The combined operations were attended with a higher mortality, *i.e.*, 8 per cent., but the method was only employed in cases of extensive disease.

Thirty-four cases of pyosalpinx were also treated by vaginal drainage, the end results were disappointing, and many cases had to be dealt with later by abdominal section for removal of the affected fallopian tubes.

Vaginal drainage for a pyosalpinx is useful as a temporary measure with very distended and firmly adherent tubes, but in my experience complete removal of the tubes by a subsequent abdominal operation is almost always necessary if a real cure is to be effected.

In a few favourable cases of pyosalpinx, removal was carried out by the vaginal route, but after a short trial this mode of operating was abandoned as unsatisfactory and dangerous.

In 126 cases, the pyosalpinx removed entire was sent unopened to the pathological laboratory for bacteriological examination. The following results were obtained:—

Pus sterile	...	70 per cent.
Doubtful gonococci	...	17 "
Gonococci	...	12 "
Tubercle bacilli	...	1 "

One case of tubercular pyosalpinx was very interesting: the patient was first admitted for tubercular peritonitis, laparotomy was performed, and the peritoneum found to be generally affected with milary tuberculosis, the fallopian tubes not being especially affected. Under a course of tuberculin injections the patient recovered and remained well for three years, during which time she married; she then returned with a pelvic

tumour as high as the umbilicus and a sinus discharging through the scar of the abdominal incision. After a difficult operation in which the rectum was extensively wounded, two large tubercular pyosalpinges, together with the whole uterus, were removed and tuberculin injections again instituted. Three years after this second operation the patient is in excellent health without any signs of tuberculosis. Though pulmonary tuberculosis is not uncommon amongst the Burmese, tubercular disease of the generative organs has very rarely been met with.

cases the hæmorrhage had arisen from the rupture of a tubal pregnancy. The majority of patients operated on were between the fifth and seventh weeks of their pregnancy, but in one case only 23 days had elapsed since the last menstrual period, which was reported to have been normal in all respects.

Two cases of secondary rupture of the gestation sac were operated on, both in the sixth month of pregnancy. In both cases the development of the gestation had continued between the layers of the broad ligament. One recovered; and the

Gynæcological operations.

OPERATIONS.	Number of cases.	AGE.												RESULTS.				
		5		10		20		30		40		50				60		
		Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	
Salpingo-oöphorectomy— For ectopic gestation	54	2	...	16	...	31	2	3	52	2

Ectopic gestation.—Fifty-four cases were operated on with a mortality of 4 per cent. owing to delay in medical aid being sought, the condition of several of the patients was desperate. It was instructive to note in such cases how readily recovery took place, once the bleeding vessels had been secured and intravenous injections of saline solution instituted. Rapidity in operation was a very important consideration. In a practice where inflammatory disease of the fallopian tubes is very common, it is interesting that cases of ectopic gestation were not more frequently met with, but no connection between these two conditions could be established, and in every case operated on, the unaffected tube was found, to all appearances, quite normal.

In a large majority of cases a history of long continued previous sterility was obtained. In five cases the intra-peritoneal hæmorrhage was due to tubal abortion; in one case profuse internal bleeding was occasioned by what was possibly a

other died from hæmorrhage,—on admission she was pulseless.

The history of one patient was interesting. Though married she had never been pregnant and on this account had eight months ago undergone an operation for hysteroplexy. Six months after the operation she became pregnant, but the pregnancy was an extra-uterine one, for rupture of which she was admitted into hospital.

One case of pregnancy in a rudimentary horn of the uterus was operated on. The rudimentary horn had a long thin pedicle-like attachment to the uterus, and could be moved freely all over the abdominal cavity. The uterine tissue was greatly stretched and apparently on the point of rupturing, the tumour was removed entirely and contained a well-formed five months' fœtus. The extreme mobility of the tumour and its thin pedicle-like attachment to the unenlarged uterus, combined with the symptoms of pregnancy, made the condition one of great interest.

Gynæcological operations.

OPERATIONS.	Number of cases.	AGE.												RESULTS.			
		5		10		20		30		40		50				60	
		Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.
Hysteroplexy	145	...	...	11	...	48	...	54	...	23	...	6	...	3	...	145	...

ruptured ovarian pregnancy, both the fallopian tubes being quite normal. In the remaining

Hysteroplexy.—One hundred and fifty-five operations, with no deaths.

Ventri-suspension of the uterus was the operation performed for cases of retroversion of the uterus; the majority of the cases were complicated by the presence of adhesions tethering the fundus of the uterus in Douglas' pouch.

Dyspareunia was frequently the cause that led the patients to seek hospital relief, mostly between the ages of twenty and thirty years.

A variety of operations for suspending the uterus were tried, of which the Baldy Webster or sling operation on the whole gave the most satisfaction.

Hysteroplexy was mainly performed when prolapse of the uterus was the outstanding feature and on a more elderly class of patient.

Hysteroplexy by itself will not afford any lasting or real relief to the patient; the abdominal operation should be considered as accessory to vaginal work for the cure of the cystocele or rectocele which practically always exists also and is largely responsible for the discomfort of the patient. Two separate operations are, therefore, as a rule, necessary if a satisfactory result is to be obtained.

It was interesting to note that, though in many cases the degree of uterine prolapse was great, as a rule complete severe perineal tears were exceptional and mainly limited to those cases that gave a history of the application of forceps during labour. The large majority of the patients operated on had, however, gone through their labours without any skilled assistance. Three cases of procidentia occurred in young, nulliparous girls; in these patients slight straining protruded the cervix well outside the vulva. There was no elongation of the cervix, the pelvic contents being herniated out of the vaginal orifice. Two of the patients had worked as coolies

Hysterectomy for fibroids.—One hundred and ninety-nine operations, with a mortality of 15 per cent. The youngest patient was 22 years of age, the oldest 70 years. I am inclined to think fibroids begin to appear with Burmese females at a somewhat earlier age than with Englishwomen, since the proportion of patients operated on below 40 years is high, and the majority of the tumours were large ones of some years' duration. This peculiarity may be accounted for by the fact that nearly every Burmese woman marries about the age of 18 years, for though it is common for fibroids to originate independently of sexual activity, there seems no doubt their subsequent development is greatly accelerated by child-bearing and sexual intercourse.

Of cases operated on—

38	per cent.	had no children.
20	do.	one child.
20	do.	two children.
20	do.	four do.
2	do.	over four children.

These figures give very similar results to those collected for white races, and, since the Burmese are a fruitful race, illustrate the well-known relationship between fibroids and sterility.

In quite 60 per cent. of the cases operated on, one or both fallopian tubes were adherent, usually both tubes were so affected. In fact it was more usual than not to find the course of the operation thus complicated. In 7 per cent. of the cases definite pyosalpinx was present.

The relationship between fibroids and gross inflammatory changes in the fallopian tubes is one of considerable interest. Do fibroids predispose to pyosalpinx or pyosalpinx predispose to fibroids?

Gynæcological operations.

OPERATIONS.	Number of cases.	AGE.														RESULTS	
		5		10		20		30		40		50		60			
		Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.
Hysterectomy for fibroids—																	
Supra-vaginal hysterectomy	...	188	...	...	...	2	...	58	2	86	1	31	...	8	...	185	3
Pan-hysterectomy	...	11	...	...	...	...	...	4	...	7	...	...	...	...	...	11	...
Myomectomy	...	7	...	...	...	4	...	3	...	...	...	...	...	...	...	7	...
TOTAL	...	206	...	...	...	6	...	65	2	93	1	31	...	8	...	203	3

carrying heavy burdens, the other was a dancing girl in the habit of performing violent contortions for many hours at a time.

Myomectomy.—Seven cases, with no deaths.

The operation of myomectomy was hardly ever applicable, the fibroids were too large and too multiple.

In my experience it seems the fibroids favour the formation of pyosalpinx. Out of 378 laparotomies in which pyosalpinx was the primary reason for the operation, in only two were small fibroids of the uterus also noted. In many of these operations the body of the uterus was also removed and a special examination carried out to

determine the presence or absence of fibroids. It is true that only 42 per cent. of these patients operated on for pyosalpinx were over thirty years of age. Still if a pyosalpinx was capable of predisposing the growth of uterine fibroids it seems probable this form of tumour would have been discovered with greater frequency.

No case of fibroids complicated by the presence of pregnancy was operated on. Two such cases were met with, but in neither did any operation seem called for, and to the best of my belief the patients passed successfully through their labours.

Of the usual forms of degeneration that uterine fibroids are liable to, myxomatous degeneration was the commonest, but instances of calcareous,

and in three a Wassermann's blood test was carried out with negative results.

From a comparison of the operative statistics of the larger hospitals in England, it would appear that cases of so-called "fibrosis" of the uterus are relatively uncommon with Burmese females. So many factors, however, prevent at present Burmese women from resorting freely for hospital treatment that no definite conclusion is possible. Still if, as many suppose, "fibrosis" of the uterus is due to septic infection, one would certainly expect to meet with more cases, for chronic endometritis of gonorrhœal or puerperal origin is exceedingly common amongst the Burmese females in Rangoon.

Gynaecological operations.

OPERATIONS.	Number of cases.	AGE.												RESULTS.			
		5		10		20		30		40		50		60		Discharged.	Died.
		Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.				
Hysterectomy (Wertheim)— For cancer 	47	...	...	...	...	...	...	9	2	16	6	11	1	2	...	38	9

cystic, sarcomatous, and red degeneration were all met with.

The tumours operated on were mostly of considerable size (the largest weighed 40 pounds), and several cervical and broad ligament fibroids by becoming impacted in the pelvis had produced much suffering; with smaller fibroids hæmorrhage was the reason that induced the patients to seek surgical relief. In such latter cases a high degree of anæmia was invariably present, but no fatality occurred amongst the cases operated on.

For fibrosis of the uterus, eight operations of supra-vaginal hysterectomy were performed. In each case the bleeding had been prolonged and severe, and in all the patients a curettement, which had been previously performed, had only increased the bleeding. A microscopical examination of the removed uteri showed the muscular tissue to have been replaced by an excessive growth of fibrous tissue, and also an abnormal thickening of the outer and middle coats of the uterine blood vessels. In no case was the uterus markedly enlarged, though it was hardened and tougher than normal. All the patients were exceedingly anæmic, and one patient who refused operation, I ascertained, died shortly afterwards. In three cases whose after-history could be followed, the results of the operation were excellent. None of the patients operated on showed any signs of syphilis,

Hysterectomy (Wertheim) for cancer.—Forty-seven cases, with mortality of 24 per cent.—a very discouraging state of affairs. Improved technique in operating will no doubt result in a diminished mortality, but anything like good results cannot be expected until patients present themselves in a less advanced stage of the disease than they do now. In Europe the percentage operability varies from 40 per cent. to 70 per cent., here in only 35 cent. of the patients who sought hospital treatment for cancer of the cervix were operative measures considered to have a fair chance of success, and in 12 cases exploratory laparotomy disclosed that the disease was too extensive for removal.

The decades in which uterine cancer were most common corresponded closely with those of white races, the youngest patient was aged 26 years, the eldest 58 years. In close on 200 patients suffering from undoubted cancer of the cervix, the following age incidence was arrived at:—

1 per cent. was between	20—30 years
32 do.	do. 30—40 "
48 do.	do. 40—50 "
17 do.	do. 50—60 "
2 do.	do. 60 and over.

The old impression that in America cancer of the uterus was relatively less common in negroes than in white women, has disappeared with increasing knowledge. A similar conclusion

will, I believe, be made with regard to Asiatic women, when their treatment for gynaecological disease becomes more general. At any rate, so far as Burmese women are concerned I feel sure that the incidence of this form of cancer follows the same rules, both in frequency and other characteristics, as with females of fairer races.

Amongst a large number of Burmese females examined for undoubted cancer of the uterus, there have been exactly the same factors as those met with in white women.

The cancer has affected middle-aged married women who have borne many children, and in the large majority of cases the cancer has not commenced until many years have elapsed since the last pregnancy. Social position has not appeared to exert any influence on the incidence

is a question if greater prudence should not have been exercised in selecting cases for operation, but the sufferings of a patient dying from cancer under conditions where medical relief is often unobtainable are so dreadful that the surgeon is tempted to attempt a cure even at considerable risk to the patient's life.

The difficulty of following the after-history of native patients makes any investigation as to the final results of the operation of little value. Of the 38 cases that recovered from operation, four returned with a recurrence of the growth, four are known to be well three years after the operation, and the rest lost sight of, though each patient promised to come back if there was any further trouble, and each was also furnished with a card detailing the operation performed and requesting a report if the patient should attend another hospital.

Gynaecological operations.

OPERATIONS.	Number of cases.	AGE.														RESULTS.	
		5		10		20		30		40		50		60			
		Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.	Discharged.	Died.
Cæsarian section	13	1	...	4	1	5	1	1	11	2	
Exploratory laparotomy	29	1	...	9	1	13	3	1	1	...	24	5	
General peritonitis of pelvic origin	24	...	...	...	...	9	2	11	2	...	...	...	...	20	4
Miscellaneous— Supra-vaginal hysterectomy for fibro- sis of uterus	8	...	...	...	...	...	...	6	...	2	...	...	...	8	...
Pan-hysterectomy— For sarcoma of body of uterus	2	...	...	...	...	...	1	...	...	1	...	...	...	1	1
For sarcoma of cervix	2	...	...	...	...	1	...	...	1	...	...	...	...	1	1
Suture of uterus for accidental per- foration	2	...	...	...	...	...	...	2	...	...	...	...	...	2	...
TOTAL	80	1	...	15	4	33	5	17	3	1	1	...	67	13	

of the disease. If anything, cancer of the uterus has been relatively more common amongst the well-to-do Burmese female, but this I attribute to their being more likely to consult medical aid than the less educated and poorer classes.

How far these conclusions may be true as regards natives of India, the figures at my disposal are too small for any opinion to be expressed: but from a 20 years' experience on a hospital staff in Burma, I believe there is no real difference in the incidence of cancer as regards Burmese and European women. Only one case of cancer of the uterine body was operated on.

The cause of death after operation was almost invariably due to septic contamination from the growth during operation; in those cases in which this accident could be successfully avoided, recovery was as a rule rapid and satisfactory. It

Connected with the prevalence of cancer of the female pelvic organs, that of sarcomatous growths is also of interest. During the same period twelve cases were operated on and the sarcomatous nature of the growth removed identified by microscopical examination.

Wall sarcoma of uterus body	2 cases.
Sarcoma of cervix	2 "
Sarcoma of ovary	6 "
Sarcoma of retroperitoneal tissues	2 "

The youngest patient was aged 22 years, the eldest 50 years.

20—30 years	4 cases
30—40 "	3 "
40—50 "	4 "
50—60 "	1 "

In addition, in five cases operated on for uterine fibroids, sarcomatous degeneration of the growth

was found to have taken place, the ages of the patients were 35, 37, 41, 50, and 68 years, respectively. One case of sarcomatous polypus of the cervix presented unusual features. The patient, aged 35 years, greatly emaciated, was admitted with what was thought to be a large abdominal tumour, extending well above the umbilicus and a sloughing mass protruding from the vagina. On vaginal examination the mass was found to completely fill the vagina and also block the pelvis; even after introducing the whole hand into the vagina no pedicle of the tumour could be reached. Laparotomy was performed and the tumour found to be entirely intravaginal, though by enormously stretching the vagina it had so encroached on the abdominal contents as to displace most of the intestines under the ribs. The uterus was unenlarged and perched on the top of the tumour. Pan-hysterectomy was performed without any special difficulty, and to avoid sepsis the cut end of the vagina brought well out of the abdominal wound and sewn on to the skin. In spite, however, of every care, septic infection of the peritoneal cavity did occur and the patient died. The exact duration of the tumour was uncertain, but it was reported to have grown rapidly; *postmortem* examination disclosed no metastatic sarcomatous deposits.

Cæsarean section.—Thirteen cases, with two deaths.

Three cases were performed for severe eclampsia without any labour pains, all the mothers recovered and two children survived. The patients were, respectively, in the 7th, 8th, and 9th month of pregnancy. The convalescence in two cases was rapid. In the third patient, who had suffered from chronic nephritis from childhood, recovery was prolonged. The remaining eight cases were operated on for obstructed labour. All the patients admitted into hospital before labour had commenced recovered; of those admitted in labour, two died from puerperal sepsis. With native patients, owing to the unreliability of the history obtainable, it is exceedingly difficult to judge if septic infection of the genital tract has occurred or not, and on this account in all cases admitted in labour cæsarean hysterectomy was performed.

The post-operative mortality was due to a great variety of causes, including three fatal cases of delayed chloroform poisoning; nevertheless there was no doubt the main cause of death was sepsis. The sepsis in every case arose from some condition complicating the operation, and in all but one case the danger was recognized at the time, and as far as possible guarded against. In cases of this nature it was remarkable how greatly the general condition of the patient influenced a fatal result or a recovery. Patients in a good condition of health were able to successfully combat considerable fouling of the

peritoneal cavity, whilst weak, debilitated persons with marked anæmia were likely to succumb to a smaller infection, which in a stronger patient would have given rise to little anxiety. Quickness in operating is no doubt a very important factor, but as long as sepsis can be avoided it seems clear that patients will make rapid recovery from most extensive operations.

Of the accidents in operating, injuries to the ureter were of special interest. Altogether eight such injuries took place in the following operations:—

Hysterectomy for cancer	...	...	2
Hysterectomy for impacted broad ligament fibroids	...	...	2
Enucleation of pyosalpinx	...	...	4

In one case of cancer a considerable length of the left ureter was deliberately cut away, in the other cases the injury was accidental. One case died,—a vulvular cut of the ureter, which was not detected till the patient subsequently developed general peritonitis. In all the other cases the injury was detected at the time of its occurrence and was dealt with as under:—In two cases the cut end of the ureter was implanted into the bladder; of these patients one suffered from a urinary fistula, which closed in a month. In the other five cases the cut ends of the ureter were simply ligatured. These latter patients all got well without any serious complication; they were drowsy for the first two days and the quantity of urine excreted was small, under 20 ounces in the 24 hours, but the amount of urine passed rapidly and progressively increased, and was normal in quantity at the end of 7 days. The patients were treated by very early and repeated purgations, whilst at the same time they were encouraged to drink plenty of water in addition to the routine treatment of saline enemata, one pint every four hours.

THE INFLUENZA PANDEMIC.

BY CAPTAIN R. N. O. MOYNAN, R.A.M.C. (S.R.), M.B.,
B.S. (Lond.),

AND

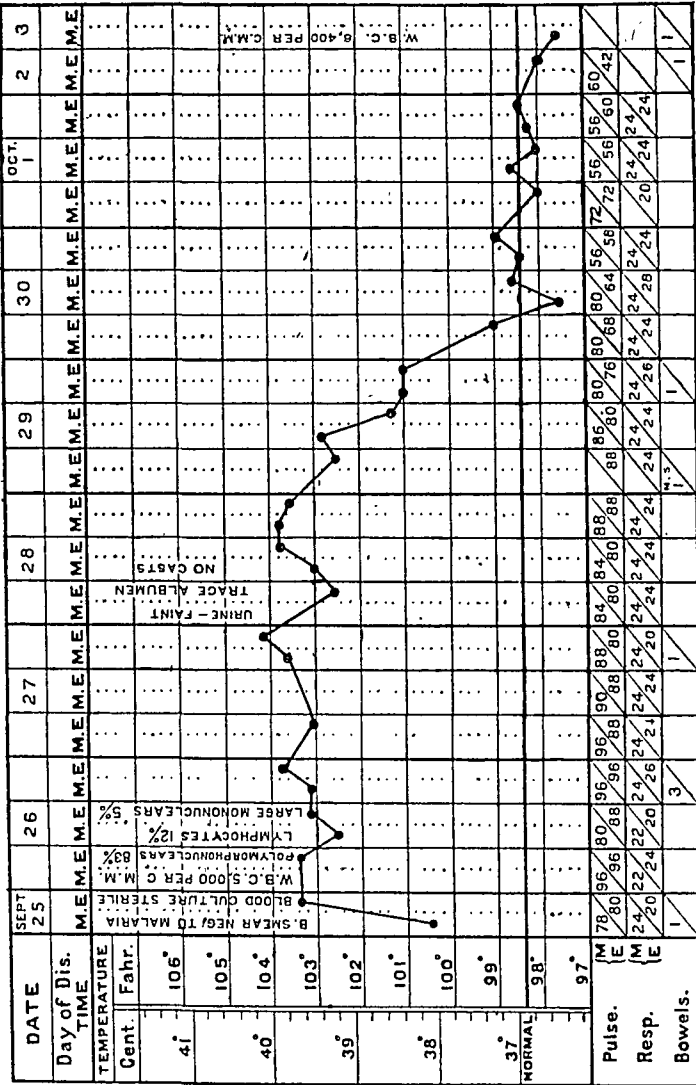
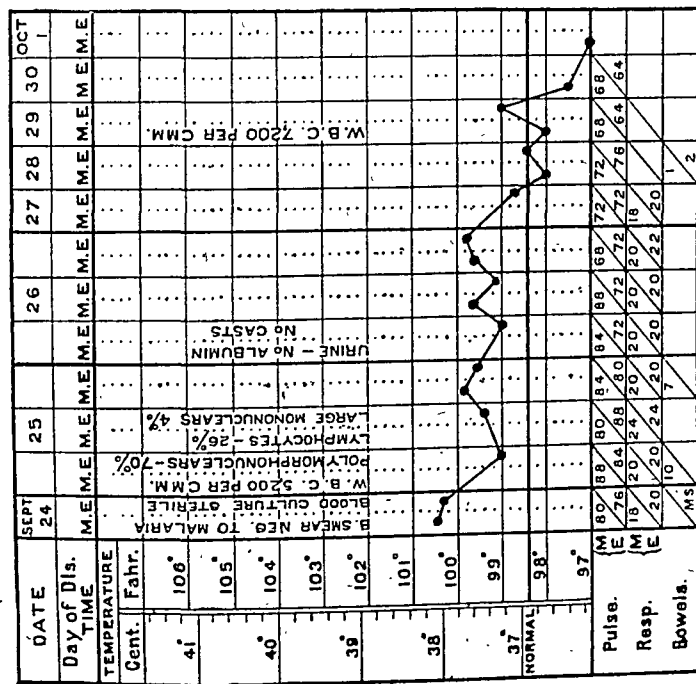
ASSISTANT SURGEON L. D. C. MENESSES, I.M.D.

THE following notes are made on cases of British troops admitted into Colaba War Hospital, Bombay, between 15th August, 1918, and 16th October, 1918.

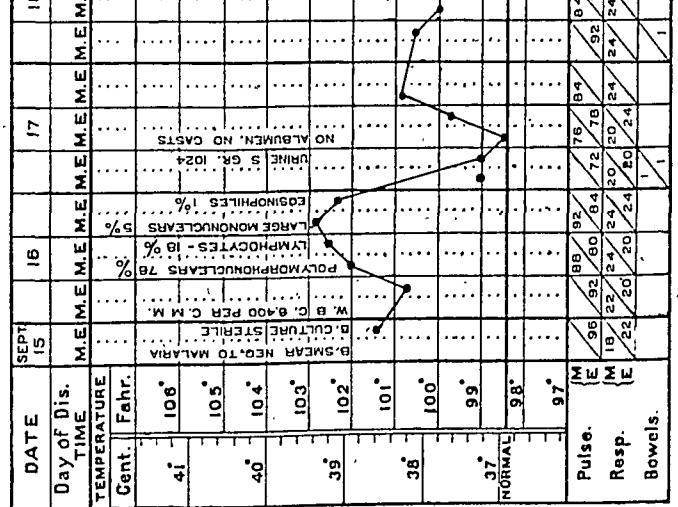
A previous epidemic, commencing about the middle of June, 1918, had ravaged Bombay and was gradually dying away when the present return wave occurred. There is a very marked difference of degree in severity between these two epidemics, the latter being much more severe as regards general symptoms and dangerous complications.

During the above period, 620 cases were admitted into the hospital, of which 35 developed broncho-pneumonia. Of these latter, 12 died and 23 recovered. In all fatal cases complete

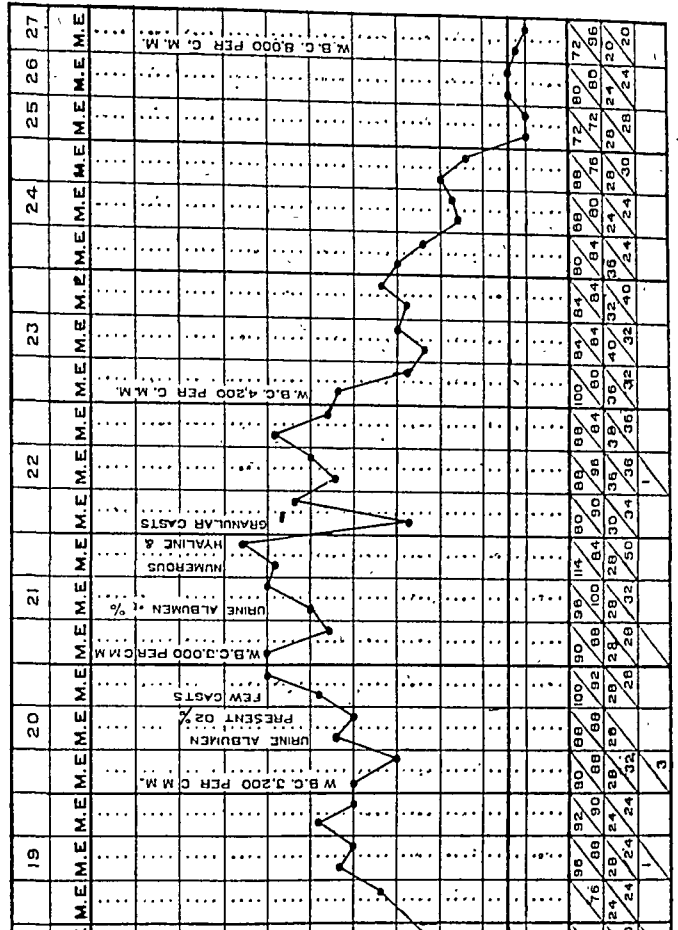
BY CAPTAIN R. N. O. MOYNAN, R.A.M.C. (S.R.), M.B., B.S. (Lond.), AND ASSISTANT SURGEON L. D. C. MENESES, I.M.D.



CATARRHAL TYPE.



BRONCHIAL TYPE.



BRONCHO-PNEUMONIC TYPE.

post-mortem investigations were made, and in every case extensive broncho-pneumonia was present.

The admissions into this hospital may be grouped into three types:—

1. Mild or catarrhal (three days' fever).
2. Bronchial (five or six days' fever).
3. Broncho-pneumonic.

(1) *Mild or catarrhal*.—Patient is admitted describing sudden onset of symptoms, perhaps 24 hours after arriving in Bombay. He has severe frontal headache and pain in back of eyes. Dull aching pain in muscles of limbs and back, throat a little sore, slight dry cough without expectoration, a few cases give history of vomiting. The majority describe a raw feeling behind sternum, and a few have abdominal pain and complain of flatulence and diarrhoea. There is complete loss of appetite, patient looked flushed and feverish, conjunctivæ suffused, tongue furred and dry, edges clean, fauces and uvula almost invariably show red spots of injection. On physical examination there is nothing abnormal to be noted. Twenty-four hours after onset the patient still complains of chest being raw and sore, and perhaps coughs up a little tenacious sputum. No physical signs in chest. On the 4th day of disease headache disappears, cough is better, temperature normal, pulse slows down to an average of 64 and convalescence is established. Chart appended.

(2) *Bronchial type*.—The onset is sudden as in the catarrhal type, but the symptoms are rather more severe. Cough and sore-throat are marked and become distinctly more troublesome during the course of illness. In several of these cases pain in the back and limbs have been absent, but the rawness of the chest has been a prominent symptom. Voice is hoarse. On physical examination tongue is furred, edges clean, throat shows patchy injection of fauces and uvula. Chest reveals rhonchi at one or both bases, but no dullness or signs of consolidated lung. After the first 48 hours headache gets worse, and large quantity of frothy tenacious sputum is coughed up. Perhaps now, in addition to the rhonchi, a few fine crepitations here and there will be discerned. The condition is practically one of acute bronchitis. On the sixth day of illness symptoms abate as rapidly as they commenced. Headache disappears, cough becomes better, temperature drops to normal, and pulse slows down. Chart appended.

(3) *Broncho-pneumonic type*.—In this type of case the onset is very similar to the other two, with fever, pain in the back, general malaise, headache, slight cough, and sore-throat. In a few cases pain is very marked in the joints and coryza very prominent. Here again the soreness over sternum on coughing is very marked. Physical signs—tongue dry and furred, throat shows patchy injection. No physical signs in chest.

On the fourth day of illness, in two of the cases the condition of the throat was unusual, and both afterwards came to the *post-mortem* room. Here the whole of the fauces and back of the soft palate was inflamed and of a uniform dusky-red cyanotic colour. For a few days patient's condition remains the same, the cough getting perhaps a little worse. About the fourth or fifth day of illness there are a few rhonchi at the bases, and the patient will probably cough up a little blood-stained sputum. Now on careful examination, a patch of bronchial breathing, with an impaired note over it, will be discovered perhaps high up in the axilla. Fine metallic crepitations are heard, and increased vocal fremitus resonance and pectoriloquy. These signs will extend within the next two or three days, the patient perhaps complaining of referred abdominal pain. Patient is very cyanosed, respirations frequent, and general condition grave. Heart keeps good, and six days after the onset of pneumonic symptoms, there is rapid improvement. Cough becomes easier, temperature falls to normal, physical signs are less marked, and convalescence established. In fatal cases of this type cyanosis becomes more marked, mental symptoms exceedingly common. Patient is delirious, struggles with his attendant and tries to get out of bed, pulse becomes weak and patient dies from toxæmia.

COMPLICATIONS AND SEQUELÆ.

(1) *Nephritis*—is the most common complication in the third type described, the urine reveals a high specific gravity, albumen ranging from .01 to .4 per cent., casts, mostly of the hyaline and granular type, are common. In some cases red blood cells are present in the urine.

(2) *Meningitis*—occurred in one fatal case together with pneumonia. Onset is very acute, patient, apparently slightly ill on admission, presented the next day all the typical symptoms of meningitis and died the same evening. Cerebro-spinal fluid under pressure and very turbid, full of leucocytes. Pneumococci were found.

(3) *Pneumococcal septicæmia*.—Three cases of this type occurred and were all fatal.

(4) *Otitis media*.—A patient who has never had previous ear trouble complains of sharp pain in one or both ears for one or two days, and perhaps on the third day there is a slight purulent discharge. In one case a pure culture of *B. pyocyaneus* was obtained from the ear discharge.

Treatment.—The majority of cases were treated as a matter of routine with 15 grains sodii salicylatis four-hourly with inhalations of tr. benz: compound and expectorant mixtures. On admission, all cases had their throats swabbed with equal parts of 1 in 1000 hydrarg. perchlor. and glycerine and were given thymol gargles (1 in 500). In the severe cases of pneumonia, treatment was largely

symptomatic. The greatest difficulty was met with in the severe cases with delirium, in which death threatened from exhaustion. It is beyond question that the lives of two of these were saved by hypodermic injections of morphia, $1/3$ grains, while 40-grain doses of pot. brom. were useful in other cases. In one of the worst cases venesection was performed and 16 ounces of blood removed. The result was not satisfactory. Oxygen seemed to have very little effect in the severe cases of pneumonia. The free use of salines seemed of benefit.

Prognosis.—The prognosis in the catarrhal and bronchial types is good. The incidence of broncho-pneumonia was low—5·6 per cent.—but the mortality for the broncho-pneumonia type was high, being 34 per cent. Cases that were apparently desperate often recovered. Violent delirium, increasing cyanosis, the rapid spread of the disease or oedema of the upper lobes, meningeal complications, old lung disease, all add to the high rate of mortality. Two cases had old empyema scars and were both fatal. Most of the cases that were fatal had been ill some days previous to admission.

POST-MORTEM APPEARANCES.

Careful *post-mortem* examinations were done on the twelve deaths referred to; and were practically alike in all cases.

Brain.—The meninges showed slight congestion. No other abnormality except in the one case of meningitis, where there was acute congestion of the meninges, a purulent exudation in the cerebral sulci, injection of the choroid plexus and flakes of lymph in the lateral ventricles. The spinal cord showed a similar condition. Both arachnoid and pia being glued to the surface of the cord by the exudate. There was injection on surface of cord.

Trachea and bronchi—showed acute congestion and inflammation throughout their course. In two cases there was a small patch of hæmorrhage on the laryngeal surface of the epiglottis.

Lungs.—As a rule the pleura showed no pathological changes except as the result of old disease (empyema in two cases). In one case the lung showed two areas of infarction, sharply defined red patches the size of a shilling projecting on the surface of the pleura, quite solid and firm on section. In all cases practically every lobé of the lungs was involved. The most prominent feature in the lung condition was the extent of the pathological change. Practically the whole of both lungs being in some state of pneumonic change early or late. The right lower lobe would be in a state of red hepatization, the middle oedematous, and the right upper in a state of engorgement commencing hepatization.

Similar condition would be found in the left lung. Small sub-pleural hæmorrhages were common, but in no case was there pleurisy, either fibronous or with effusion.

Bronchial glands were enlarged, soft and hæmorrhagic.

Spleen—shows a state of acute congestion. Capsule distended and the organ is enlarged, soft and diffuent. On section the pulp is soft and friable.

Kidneys.—Congested and enlarged. Capsule strips easily, petechial hæmorrhages on the surface of the organ. Cortex swollen. Minute hæmorrhages in the pelvis.

ÆTIOLOGY.

The epidemic is apparently spread by direct contact, and the period of incubation varies from a few hours to three days. Average age incidence 28 years. Bacteriological investigations were made from naso-pharyngeal swabs, sputum, blood cultures, cerebro-spinal fluid and post-mortem from the lung and spleen juice.

No interest was taken in the organisms present in the bacterial flora of the respiratory tract other than those shown below:—

Results of bacteriological examinations.*

	Total number examined.	Gram-pos. pleomorphic diplococcus found in.	Gram-neg. bacilli found in (Pfeiffer's bacillus.)	Gram-pos. diplococcus (pneumococcus).
Naso-pharyngeal swabs—smears ...	80	58	27	42
" " culture ...	50	38	...	19
Sputum smear ...	80	69	54	46
" " culture ...	50	43	3	13
Blood cultures ...	68	...	...	3
Cerebro-spinal fluid smears ...	4	...	...	1
" " culture ...	4	...	...	1
Lung juice (P.M.) smears ...	12	8	2	12
" " culture ...	12	5	2	7
Spleen juice (P. M.) smears ...	12	...	...	4
" " culture ...	12	...	...	3

* Media employed: Trypsin agar, fresh blood-smeared agar and serum agar.

From the above it will be seen that the organism most frequently found was a Gram-pos. diplococcus which, when present, was always the predominating organism. It was frequently obtained in pure culture from the sputum. This organism differs in many respects from Fraenkel's pneumococcus and has the following characters. It grows on agar in minute circular colonies which attain their maximum after 48 hours. They vary in size, are small, discrete, opaque and coarsely granular and have a dry appearance; they have a raised centre and a light wavy edge. In Bouillon after 48 hours there is a granular deposit at the bottom of the tube. The upper

part of the fluid remains clear. It is of a pleomorphic nature, and produced acid in glucose and saccharose, and acid and gas in maltose.

In fluid media and moist agar the organism tends to grow in chains as a diplo (?) streptococcus.

In the few instances in which Pfeiffer's bacillus was cultured all attempts at sub-culturing failed.

We suggest that, although the epidemic may possibly be due to Pfeiffer's bacillus in the beginning, yet the main pathogenic organisms are the Gram-pos. pleomorphic diplococcus and pneumococcus.

Whereas Pfeiffer's bacillus has been found in very few cases, the Gram-pos. pleomorphic diplococcus has been predominant in the material examined. The latter organism was found in 40 per cent. of the cases in the first epidemic.

The whole condition is an infection of the respiratory tract, commencing in the naso-pharynx and spreading directly so as to give rise eventually to the three types of cases described.

A Mirror of Hospital Practice.

THE TREATMENT OF PANOPHTHALMITIS.*

By A. J. E. LISTER, M.B., B.S. (Lond.), F.R.C.S. (Eng.),
MAJOR, I.M.S.,

Ophthalmic Surgeon, King George's Medical College, Lucknow.

THIS condition is particularly common in India. Its treatment, therefore, is of special importance to medical men in India. My experience is that Indian patients have a rooted objection to removal of the eyeball. The usual result in the case of hospital patients of suggesting it, is a hasty departure from the out-patient room. This leads to many eyes being left in which ought to be excised early, with the result that panophthalmitis often occurs.

There are three surgical methods ordinarily employed for the treatment of this condition.

The simplest is to incise the cornea and to allow the pus to escape. This gives relief to the pain, but it takes a long time for the eye to quiet down, after this procedure, with a consequent increased danger of complications. Under certain conditions it may be all that it is possible to do.

The other more usual methods are enucleation or evisceration of the eyeball.

The majority of ophthalmic surgeons, I think, are in favour of evisceration, as deaths have occurred after enucleation from a spread of the infection along the sheaths of the optic nerve to

the meninges. This complication, however, is not altogether excluded by adopting evisceration, but the risk is much diminished.

In both procedures there is a risk of sympathetic ophthalmia in the other eye.

In evisceration the usual practice is to incise or excise the cornea and to scrape out the contents of the globe with a curette, the interior of which is then douched with an antiseptic lotion, or swabbed out with an antiseptic, the nature of which varies with different surgeons.

This was the operation I did till quite recently.

After it, there is often a good deal of chemosis of the conjunctiva and swelling of the upper lid, and, still more important, severe and persistent pain, which is sometimes of the nature of a severe neuralgic headache. As the patient has often only resorted to operation to obtain relief from pain, much disappointment is caused. The pain in one case I had was very similar to that of acute glaucoma. This case made me very dissatisfied with the operation, and set me thinking. Compression of the ciliary nerves probably is an important factor in the pain of acute glaucoma. I thought if I removed the ciliary region in these cases I should diminish the post-operative pain. I tried this procedure and the result in my experience was a great diminution in the pain after operation. Some patients hardly complaining at all, after coming round from the anæsthetic.

The steps of the operation are as follows:—

1. The patient is given a general anæsthetic.
2. When the patient is under the anæsthetic, the eye is carefully cleaned and the conjunctival sac is well irrigated with 1 in 3000 perchloride of mercury lotion, as it is usually difficult to cleanse the eye properly before on account of the pain.

3. A cuff of conjunctiva is then turned back by making an incision round the scleral margin, and separating it carefully all round. The cuff is separated from the globe far enough back to expose the ciliary region well.

4. By means of a Graefe's knife the sclera is transfixed behind the ciliary region and the anterior segment of the eyeball removed.

5. The contents of the globe are then thoroughly scraped out, the cavity well douched with 1 in 2000 perchloride of mercury lotion and a dressing applied.

6. The eye is dressed daily till the wound heals.

Advantages of this procedure :

It is less liable to be followed by meningitis than enucleation. The danger of this condition is sometimes lost sight of. It is illustrated by the following case, which occurred in my practice. An old lady came complaining of pain in her left eye, there was obviously panophthalmitis, which did not appear very far advanced. There was no corneal ulceration or signs of perforation of the sclera.

As they came from a distance I decided to remove the globe, as also they were anxious to get

* Abstract of a Paper read before the Clinical Society at King George's Medical College, February, 1916.

away, and in my experience convalescence is quickest after this procedure.

When I came to do so, all went well till I was actually extracting the eyeball. The suppuration had however caused ulceration of the posterior portion of the sclera, with the result that it gave way and pus escaped into the orbit.

The orbital cavity was very thoroughly douched with warm 1 in 2000 perchloride of mercury lotion and the eye dressed as usual.

The patient, a very ill-nourished, feeble, old woman, seemed to do well for three days. On the third day she became very collapsed and unconscious, and meningeal symptoms set in. She was removed from hospital by her friends, in spite of our protests, in a moribund condition and I have not the slightest doubt died soon after. Such a case illustrates well the danger of removing an eyeball in panophthalmitis. It is often done, I know, with impunity in spite of its well-known danger, and I think one of the reasons which leads surgeons to do it is to avoid the post-operative pain and trouble caused by the ordinary method of evisceration. This, in my experience, is often a source of great trouble, and I have known it lead to a change of doctor after an evisceration, a matter which cannot be ignored in practice! In many cases this procedure leaves a perfectly movable stump, a condition which does not often occur after the ordinary excision; in any case a better stump is left than is usually the case after an excision in panophthalmitis. As the anterior segment of the eyeball is completely removed, freer access to the interior of the globe is possible than in the ordinary operation for evisceration. Its contents, therefore, can be removed with greater ease and certainty.

As Schieck, Schmidt Rimpler, de Schweinitz, Waldespuhl, and others have reported cases of sympathetic ophthalmia following evisceration, in which investigation showed fragments of uveal tissue left after the operation lining the sclera, this is a practical advantage worth consideration.

You can also tell the patient you are not going to remove the eyeball. This in India may lead a patient to consent to the operation, when he would refuse an enucleation, and so save him much suffering and possible loss of the other eye from sympathetic ophthalmia.

The advantage over the ordinary method of exenteration is that it is very much less painful. This, as pointed out before, is a factor of prime importance in practice. Dr. Brahma Gupta, my Demonstrator, is here and will bear me out in this point. Indeed, it is due to his emphatic reports as to the comparative freedom of patients from pain after this operation, that I have been encouraged to continue it.

You may ask, is this operation sufficiently safe for us to do it without undue anxiety? I have no

hesitation in saying, it is. I started doing this operation first in 1915 and since then have done 11 cases. This will of course be not enough to convince you, though all did well. I recently, however, saw a somewhat similar operation described which involves even more disturbance of the tissues than in the procedure just described.

You will find this on page 110 of the Memorandum on the treatment of wounds in war, published by the Army Medical Department, July 1915. This is a guarantee that it is considered a safe procedure by experienced men.

The steps of the operation here recommended are:—

1. Evisceration of the globe.
2. Division of the muscles.
3. The sclerotic is then pulled forward, and divided far back leaving only a frill round the optic nerve.

These steps are modified in certain details in different conditions of the eye.

Addendum. Since reading this paper, which has been delayed in publication owing to press of work, I have performed this operation in a large number of additional cases, and many cases have been done by my Demonstrator, Dr. Brahma Gupta. Further experience has only confirmed its utility. I now use it as a routine treatment. In certain advanced cases I now, sometimes, after making an incision through the sclera at the desired spot, finish the removal of the anterior segment with scissors. This in some cases renders the removal easier. If the conjunctiva is very infiltrated and friable, as it often is in the very late cases, I think it is advisable to remove more of the sclera, as the conjunctiva is apt to retract, allowing the edges of the sclera to separate the edges of the conjunctiva, thus delaying healing.

Similar procedures have been advocated since the reading of this paper, in the ophthalmic press, but I have not yet seen the exact procedure I describe, recommended in any of the literature I have access to. My experience shows that in the cases where the sclera is divided just behind the ciliary region an excellent movable stump results in most cases, as the attachments of the muscles have been little interfered with. It is obvious that whatever other advantages it may possess, the leaving only of a scleral ring cannot leave such a good stump as the procedure I describe.

In the military practice, where infected particles may have been driven into the sclera, there are obvious advantages in removing as much of the sclera as possible. This is not the case in civil practice. I think those who try the procedure I describe will be astonished, as I was myself, to find what an excellent, movable stump results in many cases, especially in young patients.

A DIVIDING STRETCHER.

BY C. G. TAYLOR,

ASSISTANT SURGEON,

Ambulance Transport "Syria."

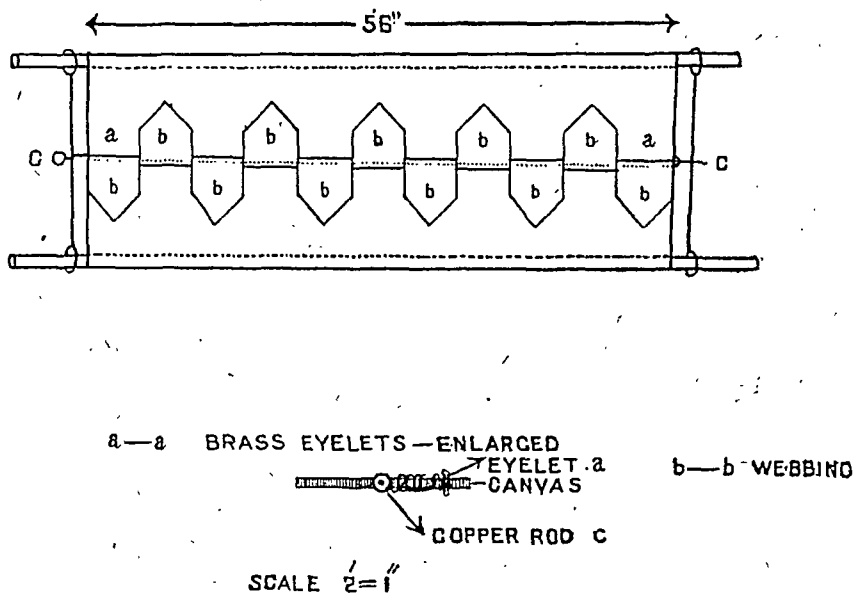
At the Government Ophthalmic Hospital, Madras, the necessity for keeping patients as quiet as possible after extraction of cataract and other intra-ocular operations was very thoroughly impressed on the whole staff, yet, often when from 25 to 40 operations were done in one morning, a certain amount of hustling was inevitable.

Though very few cases occurred in which untoward results were directly attributable to some strain or exertion on the part of the patient while being conveyed from the operation table to bed, still the marring of an otherwise successful operation was fraught with such momentous consequences as to make one set about devising means of prevention.

A slight modification of the above pattern was suggested to Lieutenant-Colonel R. H. Elliot, I.M.S., then Superintendent, Government Ophthalmic Hospital, Madras, and with his approval was taken into use, effectually solving the difficulty.

In this latter, the canvas portion is slit down the centre, or rather the unstitched canvas is, and the two selvages turned toward the middle. The cut edges are hemmed as in the old pattern. Loops of 6" girth webbing are sewn on the canvas along the selvages alternately so that loops on one side fit in between spaces on the other, and by passing a stout copper rod through the loops the two halves are laced together.

The canvas laced up is placed on the operation table and the patient lies on this as on the former pattern. (The copper rod causes no inconvenience as it is well covered by girthing and canvas.) After the operation, the bamboo poles and end rods are put in and the patient on reaching his bed is put on it.



The stretcher in use up to March, 1913, was a simple canvas one about 5' 8" x 2'. In the canvas were two wide hems or sleeves at the sides. This was placed on the table and the patient lay on it throughout the operation, and when it was over bamboo poles were slid into the hem on each side and two looped iron rods passed over the ends of the poles to keep the stretcher from sagging.

The patient was then lifted on to a wheeled carriage and taken to his bed side.

Here the difficulty of lifting the patient off the stretcher into bed without any exertion on his part was often very apparent. Though warned to lie "limp" very few really did so but subconsciously "stiffened." Further, the two stretcher-bearers had to hold the stretcher close to the bed and three or more assistants were needed to lift the patient into bed.

Now, the two end rods being removed and the copper rod withdrawn, the two canvas halves can be drawn apart from under the patient without disturbing him in the least. The two stretcher-bearers require no assistance in unloading.

It can be placed under a patient by rolling it up half way after the manner of a "draw sheet."

While its scope is limited to employment away from actual fighting on account of its complexity, still in serious cases and severe wounds it lessens the patients' sufferings during removal from stretcher to bed and *vice versa*.

Stretchers of this pattern are in use at the Government Maternity and Gynaecological Hospital and General Hospital, Madras, and on the hospital ship *Madras*.

It is much lighter than the Army Regulation, and if it is necessary to move a patient in an

ambulance fitted to take the regulation stretcher, the dividing stretcher can be placed on the other.

CIRCUMCISION.

By W. D. SUTHERLAND, M.D.,

LIEUT.-COLONEL, I.M.S.

THIS little mutilation is seldom necessary. I have often been requested to circumcise infants, but have not done the operation, for the reasons set forth below:—

What I did do in cases of phimosis and found to be adequate, was to slit the under-surface of the prepuce longitudinally so, as to sever the constriction-ring, and then to stitch the ends of the incision to each other so as to make the wound transverse and thus widen the tight part of the prepuce. For some six days after the operation the prepuce is œdematous, but thereafter everything is as before, and the infant, when he grows up, has no cause to complain of the way in which he was treated.

Any adhesions, and these are usually slight, that exist between the under-surface of the prepuce and the glans are easily broken down, and the smegma-laden surface thoroughly cleaned. After the stitches are tied the surfaces are smeared with some bland unguent, so that future manipulations may cause as little pain to the infant as is possible in the circumstances, and the renewal of the adhesions that have been got rid of may be prevented.

Many a mother desires to have her infant circumcised because she has heard, or imagined, that the denudation of the glans has the following advantages:—

Cleanliness.—To me the question as to whether it is more cleanly to remove the secretion of the *glandulæ odoriferae* daily by ablution, or to have it continuously removed by the wearing apparel seems to admit of only one answer, when the points noted below have been considered.

"Bad habits."—I am sure that boys will be boys, whether circumcised or not, and that the removal of the prepuce does not tend to do what the mother hopes it will do.

Protection against disease.—The preputial secretion is a natural unguent which keeps the skin of the parts elastic and lissom. The circumcised glans, on the other hand, has leathery integument, which easily develops a fissure, through which the *treponema pallidum* may enter.

Besides, we have two reasons against the denudation of the glans, that to me, at least,

appear to merit consideration. It has not æsthetics in its favour, for if this were the case then we may be sure that artistic Greeks would have seen to it that their statues, which are for all time exponents of the best types of the human form, would show the denuded glans.

As a matter of fact that very primitive contrivance, the intromittent organ, seemed to them to be so far from æsthetically commendable that in their statues they minimised its proportions. Last but not least we have the fact that the delicate sensibility of the parts which nature has in view is blunted by the results of circumcision.

REVIEW.

A Manual of Physiology.—By G. N. STEWART, M.D. Eighth Edition. Demy 8vo, pages xxiv + 1245. Plates 1 coloured and figures in text 492. Price 21s. net. London: Ballière, Tindall & Cox, 1918.

THIS is one of the most successful of medical students' text books. Its first edition appeared in 1896, since which date no less than 12 reprints or new editions have appeared, which shows clearly the hold it has got on several generations of medical students.

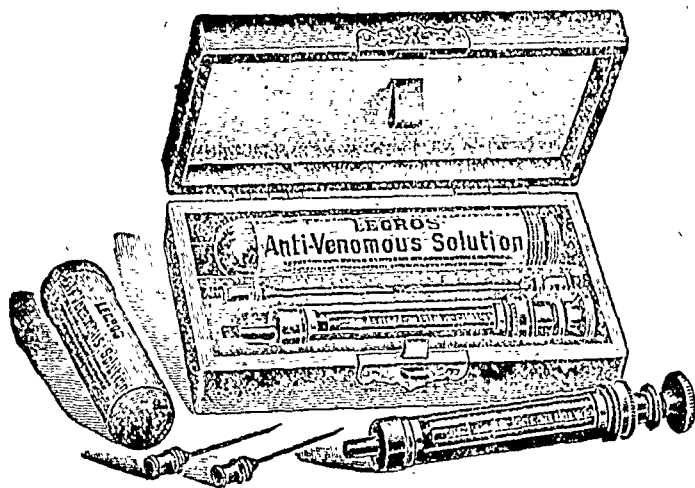
In the present edition we find several important additions and revisions, especially in the portions dealing with the chemical phenomena of respiration, and with the functions of the so-called endocrine organs. The filtration-absorption theory of urine formation as formulated by Professor Cushny is given in considerable detail.

The useful practical exercises have been retained. The book is very well illustrated, and we have no doubt that the eighth new edition will be found as useful and as accurate as the previous editions. It is at present the standard text-book for students.

THE Oxford Press has in preparation a new book on *The Practice of Medicine in the Tropics*; Sir L. Rogers writes on cholera; Sir Walter Buchanan on cerebrospinal fever; Major J. Cunningham, I.M.S., on hill diarrhoea; Dr. Bahr on dysentery, etc., etc.

Rational Scientific Treatment of Bites of Venomous Serpents or Stings of Venomous Insects on Man and Animals.

THEIR CURE—



BY THE USE OF—

Michel Legros' Outfit

Dr. Michel Legros' Outfit is put up in a strong little case (3.2 x 1.6 x 0.8 in.) and weighs 1 oz. It takes up no more room in the pocket than an ordinary match-box, and can therefore be carried without inconvenience.

Dr. Michel Legros' Outfit contains—

- 1 Tube of Solution for four injections.
- 1 strong metal-mounted Syringe.
- 2 adequate Needles.

Dr. Michel Legros' Solution is always effective and may be kept any length of time.

Separate Tubes of Solution are supplied at very moderate prices.

FULL DIRECTIONS SUPPLIED WITH EACH TUBE OR OUTFIT.

Rational Treatment of Constipation

By the double action of Secretions and Peristalsis.

OPOLAXYL

Opolaxyl is a combination of the secretions of the liver (biliary), pancreas, and intestines, with vegetable extract of a non-drastic nature.

It combines all the secretions to correspond to nature's therapy, and promotes a flow of bile and glycogen with their hæmatopoietic and antitoxic properties.

It is a normal regulator of the gastro-intestinal functions; consequently it improves the metabolic exchanges in the entire organism.

DOSE.—For obstinate constipation 2 or 3 tablets, afterwards 1 tablet every 3 or 4 days for a month.

LEGROS' SOLUTION AND SNAKE BITES.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—I beg to send you notes on the use of Michel Legros' Anti-Venomous Solution in cases of snake-bite, which may be kindly inserted in the *Indian Medical Gazette*.

Recently I was called to see a case of snake-bite. A boy, aged about 18, was bitten on his right foot by a cobra at about 7 A.M. The patient immediately after the bite tied a ligature tightly round the leg below the knee with a rope which he carried with him for his cattle, and cried aloud for help. His neighbours hurried up to the place and killed the serpent, which lay hidden in an adjacent bush. The serpent was 4½ feet long, and its diameter at the middle was 5½ inches; many native *ojhas* assembled and tried their *mantras*. At about 8.30 A.M. symptoms of poisoning developed, notwithstanding the three additional ligatures tied by the men subsequently. I reached the place at 9 A.M., when the condition of the patient was as follows:—Eyes opened and turned upwards, the tongue fixed between the teeth which could not be separated, the heart's beat was very feeble, limbs cold. At once I injected 15 minims of Anti-Venomous Solution on the right forearm and 15 minims in two places on the right thigh, which was much swollen. After ten minutes I again injected 10 minims into the left forearm and 15 minims in two places near the site of the bite, and made several incisions near the site of inoculation and freely rubbed in crystals of Pot. Permang. I left the patient at 1.30 P.M., when he could speak with ease and all the symptoms had considerably subsided. He only complained of severe pain in his right leg, for which I prescribed hot Permang. bath. Next morning the patient was all right.

From the above it will appear that the life of the patient was saved by Michel Legros' Anti-Venomous Solution.

It is a very simple remedy, administration of which requires no special skill; my tube of solution was about a year old, and I understand the solution keeps well for several years.

The following points are most important:—The venom is not, as a rule, carried immediately in its entirety into the circulation (except in cases when the bite has penetrated into a vein, in such cases death may be caused immediately). The venom first reaches the small blood vessels, by its own action on blood the local circulation is arrested, and this prevents the immediate diffusion of the poison throughout the organism.

When the poisoning symptoms have already developed, a dose should be injected into the healthier tissues above the wound and swollen parts. Another should be given in two or three places near the site of the bite. This may be repeated if the condition of the patient becomes more grave. The solution must be injected deeply into the tissues for rapid absorption. Medical practitioners can easily and conveniently carry a tube of solution containing four doses at the nominal cost of Rs. 4 per tube.

Yours, etc.,

BINODPUR, JESSORE, }

20th June, 1917. }

S. G.,

Medical Practitioner.

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IODARGOL

Special Colloidal Iodine.

NON-TOXIC / PAINLESS FOR THE TREATMENT of Gonorrhœa: Acute and Chronic. Urethritis: Of Old Standing.

DIFFUSIBLE ANTISEPTIC ANALGESIC

Cystitis and the Serious Complications of Gonorrhœa. Ampoules and Phials for Injection or Soluble Bougies.

FOR GYNÆCOLOGY OVULES

UTERO-TOPIQUE
IODARGOL. Direct Intra-uterine Medication.

These are introduced into the vagina and slowly discharge the Iodine, which penetrates deeply into the vaginal mucous membrane, giving rapid relief from congestion and pain. Destructive to the micro-organisms.

As a wound dressing Iodargol on account of its antitoxic and dermoplastic action prevents or ameliorates the fever due to infection, cuts short suppuration, eliminates the sloughing portions and cleans the wound, at the same time stimulating epidermisation and cicatrisation.

IODEOL OVULES for Vaginitis, Metritis, etc.

IODEOL CAPSULES contain 4 grains of Iodine in each. Never cause Iodism.

More powerful and active than Iodine without its drawbacks.

The treatment of Carbuncles, Boils, Anthrax, Acne, Styes, and diseases arising from **STAPHYLOCOCCUS**.

STANNOXYL

(An Oxide of Tin and Tin Meal free from Lead.)

A truly scientific production the value of which has been studied very closely. The effect is really wonderful; from the second day of treatment the pain is relieved and the carbuncles begin to dry up, those which are just opening are stopped in their course; the core is not expelled but reabsorbed.

In the majority of cases a complete cure is effected by the fifth or sixth day, it is seldom necessary to take the full 10 days' treatment, and relapses are unknown, indeed it is a specific for diseases arising from Staphylococcus.

The daily dose for Adults is 4 to 8 tablets;
Children, 2 to 4 tablets.

Supplied in vials of 80 tablets.

URASEPTINE

The Most Powerful and Effective Urinary Antiseptic.

URASEPTINE is a granulated product entirely soluble in water, its bases being Piperazine, Urotropine, Helmitol, Benzoates of Sodium and Lithium. It contains 60 centigrams (10 grs.) of active matter to each teaspoonful. **DOSE.**—2–6 teaspoonfuls daily.

It purifies the Urine, and this action is due to its three principal properties:

1. It is a **URINARY ANTISEPTIC**.
2. A **SOLVENT** of **URIC ACID** and of **PHOSPHATES**.
3. A **MILD NON-TOXIC DIURETIC**.

INDICATIONS.—Arthritism, Gout, Gravel, Hepatic and Renal Colic, Rheumatism, Calculus, etc., Phosphaturia, Urinary Antisepsis, Pyelitis, Bacteriuria, Cystitis, Prostatitis, Urethritis, Pyuria, Urinary Abscess, Vesical Catarrh, etc.

ANTICONOCOCCIC



The clinical reports given by various doctors show that Rhéantine gives highly satisfactory results, both in acute and chronic forms of Gonorrhœa and also in the various infectious complications due to Neisser's bacillus.

Rhéantine is put up in hermetically sealed tins, containing 28 spherules. **Dosage.**—4 spherules a day.

Therapeutic Association of Paris (14th June, 1916): the result of their observations:—

"It is not a rare thing," write these authors, "to observe in the very first days a more or less marked recrudescence of the discharge. This negative phase, which, however, is temporary, is always followed by a well-defined positive phase, in the course of which the characteristics of the urethral pus undergo a rapid change; the discharge, which is at first thick, abundant, and creamy, passes gradually into the hyaline state, diminishes in quantity, and in the majority of cases ceases."

"Under the microscope these successive stages are demonstrated in equally definite stages; whatever may have been the duration of the disease, the characteristics of the pus become rapidly modified; after two or three days' treatment the gonococcus, first intracellular, becomes exterior; it ceases to act as a parasite on the polynuclear leucocytes and the large epithelial cells—one then finds them disseminated outside the leucocytes."

"Finally, some days later, if the administration of Rhéantine is continued, the condition undergoes still further change, the gonococci become agglutinated, arranged in a mass, and finally bacteriolysed."

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Recurrent Fever SYPHILIS

GALYL

Framboesia and
Sleeping Sickness

Practical work with GALYL in the shape of

60,000 INTRAVENOUS (Dilute and Concentrated) and **INTRAMUSCULAR INJECTIONS** administered in Military, Naval and the principal General Hospitals throughout the United Kingdom, has demonstrated that this preparation is **more rapid and less toxic** in action than any compound of the "606" group, which accounts for the **consistently excellent clinical results without any undesirable by-effects.**

Forms:

.....FOR INTRAVENOUS INJECTIONS:—

(1) **DILUTE.**—GALYL is supplied in neutral glass ampoules containing the necessary dose of Sodium Carbonate, sterile distilled water only being used for the dissolution.

(2) **CONCENTRATED.**—A special outfit containing one dose GALYL, one ampoule sterilised solution, and one small filter is supplied.

Doses:

0.10—0.15—0.20—0.25—0.30—0.35—0.40

(3) **FOR INTRAMUSCULAR INJECTIONS:—**
GALYL is supplied in **OILY EMULSION.**

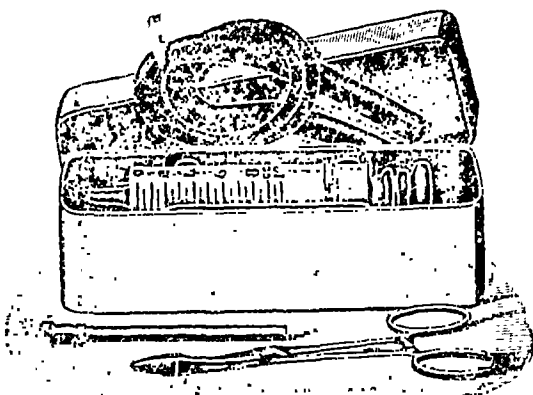
Doses:

0.10—0.15—0.20—0.30—0.40.

POCKET CASE.

Containing the entire instruments (sterilizable) necessary for administering a concentrated intravenous injection of GALYL or other solution.

- 1 India-rubber Tube for constricting the arm.
- 1 Clamp for fixing the rubber band.
- 1 Glass Syringe of 10 c.c. capacity.



- 1 Platinum-iridium Needle, length 4 cm., diameter 0.9, with short bevelled joint and special barrel. Attachable to the syringe without any additional junction.

- 1 Nickel-plated Case to hold all the above.

- 1 Chamois Leather Pouch.

- 1 Glass Filtering Tube, with rubber attachment.

Price complete 30/-

HECTINE

Formula: Sodil Benzo-sulpho-p-amniaphenyl arsonas.

Dr. Mouneyrat—the discoverer of Galyl (the well-known and widely adopted French Neo-Salvarsan substitute) and also Hectine, a compound which—though it possesses a very low arsenic percentage and has proved most safe in use—gives remarkably successful clinical results in syphilis and the parasymphilitic affections. Hectine has a record of about one million injections.

Hectine is not only a specific in syphilis, but it acts as a general tonic in the treatment of bloodless and anæmic patients and in all cases where **Arsenic** is indicated.

In malaria it acts as a specific owing to its anti-parasitoid and anti-thermic actions; also in tuberculosis, rachitism, neurasthenia, asthma, chorea, skin diseases, etc., etc.

Hectine is supplied in hermetically sealed ampoules for intramuscular injections.

Ampoules A—containing 10 c.g. in 1 c.c.

Ampoules B—containing 20 c.g. in 1 c.c.

Pills (in phials of 24) 10 c.g.

HECTARGYRE

(Mercurial Salt of Hectine)

Hectargyre being a **double specific** cures syphilis and all its manifestations more rapidly and more surely than any other mercurial preparation.

As a treatment following Galyl, or *ab initio* in all stages of the disease, Hectargyre is very effective and rapid; it is well tolerated even where prolonged treatment is necessary; the most intractable cases of syphilis have yielded highly satisfactory results.

Hectargyre is supplied in sterile ampoules for intramuscular injections.

Ampoules A containing—

Hectine 10 c.g. }
Hg. 1 c.g. } in 1 c.c.

Ampoules B containing—

Hectine 20 c.g. }
Hg. 1½ c.g. } in 1 c.c.

Pills containing—

Hectine 10 c.g.
Protoid of Hg. 1 c.g.
Opium Extract 1 c.g.
(In phials of 24 pills.)

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NEOCAINE-SURRENINE

Neocaine is a synthetic product of French manufacture.

A Perfect COCAINE SUBSTITUTE of Low Toxicity.

A White Powder, readily soluble in water. Analgesic power, duration, and rapidity of action quite equal to Cocaine.

Toxicity less than one-sixth.

Therapeutical effects identical with Cocaine (excepting as an exhilarant) for **Dental or Surgical, local and Spinal Anæsthesia, Lozenges, Snuffs, Ointments, &c.**

Composition of Neocaine-Surrenine.

Pure Neocaine	...	...	5 c.g.
Acid Borate of Adrenalin (Takamine)	..	...	0.1 m.g.

Pure Neocaine is also supplied.

FORMS.—Powder in capsules and phials. Ready prepared solutions in Ampoules (various percentages), and Ampoules of sterilised liquid for making solutions.

THE MEDICAL TREATMENT OF CANCER.

CUPRASE

CUPRASE is a colloidal copper hydroxide which is obtained chemically by the reduction of salts of copper in the presence of albuminosic acid.

As a result of over ten years' research work on Cancer, Dr. Gaube du Gers produced a new Colloidal Copper Hydroxide which has given remarkable results in *arresting the progress of the disease*, with loss of pain, and great improvement in the general condition of the patient.

The numerous clinical reports from Doctors of repute in various countries, give cases of a great variety. In all of these *pain has been eliminated*, and a good percentage of *cures are claimed*, and in no instance *any undesirable effects*.

Its *easy application* (intramuscular injections) places it within the reach of all practitioners. It is *not toxic*.

Disappearance of the Pain.

Return of Sleep.

Increase of Appetite.

Colour and Strength.

Supplied in boxes of 8 ampoules.

WARWICKSHIRE, July 1st, 1917.

DEAR SIRS,—Will you please send me another box of Cuprase ampoules. The previous lot effected a most remarkable cure in an elderly lady suffering from cervical cancer—the cauliflower-like growth has disappeared with its offensive discharge.

This case was given three months' life by a Specialist, being inoperable.

Yours faithfully,

(Signed) B—B—, M.R.C.S., L.R.C.P.

ANTITYPHOID

Inoculation by the gastro-intestinal tract



TYPHOID BACILLI

The results of **4,000** applications of **Enterovaccin** carried out by approximately 200 Doctors are as follows:

1. **No one** who has been treated with **Enterovaccin** has been attacked by typhoid fever.
2. This method of immunisation is without risk.
3. There is no contra-indication.

Enterovaccin is put up in hermetically sealed tins containing 28 spherules, sufficient for a complete treatment (one week). Each spherule contains per milligramme:

300 millions Eberth bacilli. 180 millions coli bacilli. 120 millions paratyphoid bacilli.

IODEOL

Perfectly tolerated. Never causes Iodism.

Each capsule contains 4 grains of Colloidal Iodine in the most minute form of subdivision known.

It is administered by
INTRAMUSCULAR INJECTION

for

Pneumococcal Disease
—Simple and Infective—
and

Bt the cho-Pneumonia

the pas Bronchitis

Pulmonary Congestion
TUBERCULOSIS, &c.

By the Mouth (Capsules):

Syphilis, or wherever Iodides are indicated. **Iodeol** is ten times more active and does not cause Iodism.

Externally (Liquid):

Contains 50 per cent. Colloidal Iodine (must not be used for injection), ten times more active than painting with Iodine tincture—does not produce erythema or irritation. Absorption is extremely rapid.

For Gynæcology (Ovules):

These are introduced into the vagina, slowly discharge the Iodine, which penetrates deeply into the vaginal mucous membrane, giving rapid relief from congestion and pain.

Destructive to the micro-organisms.

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Indian Medical Gazette.

JANUARY.

ANNUS MEDICUS, 1918.

THE Great War has been the main pre-occupation of the world during most of the year 1918, but in October and November the cause of the Allies proved triumphant and the German debacle led to the Armistice, and the discussion of Peace terms is about to follow.

This great change will mean much to the medical services in India, and early, we hope, in the new year we may look forward to one of results of peace—in demobilization and the re-opening of long deferred leave and furlough.

For the Indian Medical Service the year has been one of expectation. The often-talked-of station hospital system for Indian troops has at last been set agoing, and recently new scales of pay have been sanctioned. We regret to see that these provide no substantial benefit to the men employed: some officers will get charge allowances and second-in-command allowances, but all will lose their regimental allowances, and as far as we can see the new rates will fail to give content.

As for the civil side of the Service, even the very meagre increments, proposed as a temporary measure by the Royal Commission on the Public Services, have not yet been granted, and there is a very strong feeling that such petty improvements will bring neither content to the service, nor will they be in any way attractive to would-be recruits. Something very much more radical is needed before men at Home will volunteer to enter the service, especially as the losses in the War and the marked shortage of medical men at Home have greatly raised the value of medical work at Home.

The Secretary of State, ably backed by the British Medical Association, has realised and has demonstrated the great need of reform, but up to the time of writing nothing has been announced.

In our own columns, during the year attention has been devoted to the many subjects, *e.g.*, war surgery, on which we have published several valuable papers. The value of quinine as a prophylactic has been questioned and has been

ably defended, its curative value is everywhere acknowledged, but there has been considerable discussion as to the best means of administering it.

The discussions on plague have mainly been around the question of killing rats, which harbour the plague-bearing fleas. It seems to us that the objections taken to rat-extermination as a plague preventive measure have been mainly due to the difficulty of doing the work thoroughly. Spasmodic rat-killing will always be of little use, but there is much evidence to show that 'systematic, thorough and persistent campaigns against rats are of great value and importance, and we again call attention to the memorandum issued by the Sanitary Commissioner with the Government of India on this subject (*Indian Medical Gazette*, page 284, August). The prevalence of hookworm as a debilitating agency has received much attention, and in Bengal His Excellency the Governor has inaugurated a campaign against this parasite.

The treatment of leprosy by gynocardates has been much discussed, and we have published several papers which show that very great amelioration and very great comfort to the patient will certainly follow a course of treatment by these drugs.

Other papers of value on a variety of subjects have appeared in our columns, among which we may mention Captain Finny's paper on heatstroke or sunstroke, Dr. Nicholl's on etiology of sprue, Dr. K. K. Chatterjee's on the value of margosic acid (*nim*), and two good papers on actinomycosis.

Influenza has reappeared in pandemic form all over India. The outbreak which broke out in Bombay in July has been fully reported on by Captain Phipson. In its incidence and rapid spread it recalls forcibly the invasion of thirty years ago, and clinically the so-called "Spanish" influenza of this year differs but little if at all from the so-called "Russian" influenza of 1889-90.

Among books published by medical officers and professional men in India during the past year we may mention Elliot's books on Glaucoma, Waters' on Diabetes, Deare's new edition of *Materia Medica*, and Muir's *Treatment of Kala-azar*. We are glad to have been able to publish the transactions of the War Hospitals Societies of Bombay, and would welcome more such societies.

Lieutenant-Colonel Sprawson and Major Mackie published a valuable preliminary note on what seemed to be a new long-continued fever in Mesopotamia.

It yet remains to be proved that this is a separate entity and work on the subject continues. Under war conditions, with the necessity of removing the sick to the base, it is obviously very difficult for such very long cases to be followed up in the way necessary.

The I. M. S. and the medical profession have come out well in the various honours lists published, and doubtless after the war more well earned honours will have to be recorded.

The beginning of the year saw the place of Sir Pardey Lukis filled by the appointment as Director-General of Major-General W. R. Edwards, C.B., C.M.G., an appointment universally approved of.

During the year two Colonel's appointments were converted into two Surgeon-Generalships, and no better choice could have been made than that of Colonels Manifold and Hehir. Colonel W. R. B. Robinson, C.B., succeeded Major-General Edwards as Surgeon-General, with the Government of Bengal, and Colonel Hendley left the Punjab, where he served so long, to take up a Surgeon-Generalship at Quetta.

It is to be hoped that these Surgeon-Generalships as well as the new Colonelcies will not merely be for the period of the War.

The year which has passed has deprived the Service of many well-known men, either by death or retirement. Among those who retired has been Major-General W. B. Bannerman, C.S.I., who retired from Madras, and has been succeeded by Major-General G. G. Giffard, C.S.I.; Surgeon-General Tom Grainger, C.B., went Home early last year and has since retired. Among more junior men who have retired we may mention Lieutenant-Colonel J. G. Jordan, Lieutenant-Colonel D. T. Lane, Lieutenant-Colonel S. P. James.

Death too has been busy and many well-known names have disappeared from the lists, among whom we may mention Deputy Surgeon-General J. H. Lock, Colonel C. F. Willis, C.B., Surgeon-Major J. Robb, Lieutenant-Colonel Edwin Dobson—drowned in the torpedoing of a ship *en route* to South Africa in the last month of the hostilities,—Lieutenant-Colonel Robert Bird, Lieutenant-Colonel A. L. Duke, Lieutenant-

Colonel A. J. Sargent, Lieutenant-Colonel W. H. Quicke, Lieutenant-Colonel Moorhead, and Lieutenant-Colonel M. A. T. Collie—all men of mark in their day. The veteran Surgeon-General Sir Adam Scott-Reid, too, has died, as also Sir Alexander Christison, *Bart.*, the doyen of the I.M.S., while Captain A. K. Sinha has been killed in action and Temporary Lieutenant K. H. Bhat was drowned while on active service. Dr. W. C. Hossack died in Calcutta in the beginning of the year.

We must again express our indebtedness to Lieutenant-Colonel D. G. Crawford, I.M.S. (*retd.*), who has so regularly supplied us with notes on the long lists of medical officers who perished in the War.

Peace is now in sight, and may it bring contentment to the service and to the medical profession in India!

Current Topics.

PAY AND ALLOWANCES, I. M. S.

For the Military side of the Indian Medical Service the following rates of pay are announced in Appendix B to Army Instruction (India) No. 1343 of 1918, *i.e.*, the instruction dealing with the establishment of the station hospital system (*vide* below) for Indian troops.

With effect from the 1st December, 1918, the grade pay of officers of the Indian Medical Service in military employment (with the exception of those holding appointments carrying staff pay or consolidated pay, or those for which special rates of pay have been authorised) will be as follows:—

	Rs. per ensem.
Lieutenant-Colonel specially selected for increased pay	1,250
Lieutenant-Colonel	1,100
Major, after 3 years' service as Major	825
Major	750
Captain, after 10 years' total service	700
" " 7 " "	650
" " 5 " "	600
Captain	550
Lieutenant	450

Separate orders will be issued in regard to the emoluments of temporary officers of the Indian Medical Service under the scheme.

2. The above rates of pay represent the total remuneration for duties which officers of the Indian Medical Service (other than those holding appointments which carry staff or consolidated pay or for which special rates of pay have been authorised) may be called on to perform.

The following are also exceptions to this rule:—

(a) The extra allowances included in Army Regulations, India, Volume I, paragraph 11 (a), except that authorised for medical charge of the Cavalry of the Corps of Guides, which will be abolished;

(b) the specialist allowance authorised in Army Regulations, India, Volume I, paragraph 155 (d) (iv);

(c) the charge allowances referred to in paragraph 5 of this appendix.

3. The allowances for the additional and temporary medical charge of troops and followers, admissible to officers of the Royal Army Medical Corps, and Indian Medical Service, under Army Regulations, India, Volume I, paragraphs 11 (b), (c) and (d), and 117, and also all similar charge allowances for labour corps, etc., will be abolished.

4. The horse allowance at present admissible to officers of the Indian Medical Service in medical charge of Indian Cavalry regiments (Army Regulations, India, Volume I, paragraph 264) will be abolished.

5. Charge allowance for officers commanding Indian station hospitals and second-in-command allowance for officers appointed second-in-command of first and second class Indian station hospitals, will be admissible at the following rates in addition to the rates of grade pay shown in paragraph 1 above:—

(a) Charge allowance.

	Rs. per monsem.
1st class hospitals ...	240
2nd " " ...	180
3rd " " ...	120
4th and 5th class hospitals ...	Nil.

(b) Second-in-command allowance.

1st class hospitals ...	120
2nd " " ...	90

6. Officers, except those holding appointments which carry staff or consolidated pay, will, while on general leave in India, draw grade pay according to the scale given in paragraph 1 of this appendix.

7. The rates of pay and the rules governing the pay (including the pay while on general leave in India) of officers holding appointments which carry staff pay or consolidated pay will remain as at present.

8. If, under the new arrangements, the emoluments of any officer, now serving, fall below the present consolidated pay of an officer of his seniority in charge of a regiment (Army Regulations, India, Volume I, paragraph 11), the case should be submitted for the orders of the Government of India. The term emoluments, as used here, does not include the specialist allowance admissible under Army Regulations, India, Volume I, paragraph 155 (d) (iv).

Regimental pay being thus abolished, it is worth while comparing the new and the old rates of pay.

RANK.	Grade pay, old.	Grade pay, new.
	Rupees per monsem.	Rupees per month.
Lieutenant... ..	350	450
Captain	400	550
Captain (after 5 years) ...	450	600
" " 7 " ...	500	650
" " 10 " ...	550	700
Major	650	750
Major (after 3 years) ...	750	825
Lieutenant-Colonel ...	900	1,100
Lieutenant-Colonel (after 25 years)	900	.....
Lieutenant-Colonel (selected list) ...	1,000	1,250

So far so good—but as regimental allowances are abolished we must compare the old regimental pay with the new grade pay *plus* charge allowances. We may assume that Lieutenants

and junior Captains are usually only in officiating charge of a regiment, and we may also assume that officers of this rank are not usually in charge of station hospitals and consequently will not usually get the "charge allowances."

Rank.	Regimental pay.	New pay including charge allowances.	Total new.
	Rs.	Rs.	Rs.
Lieutenant...	450 (officiating)	450 + nil	= 450
Captain ...	500 do.	550 + nil	= 550
Captain (after 5 years) ...	600 (permahent)	600 + 120 (possibly)	= 720
Captain (after 7 years) ...	650 do.	650 + 120 do.	= 770
Captain (after 10 years) ...	700 do.	700 + 120 do.	= 820
Major ...	800 ...	750 + 180 do.	= 930
Major (after 3 years) ...	900 ...	825 + 180	= 1,005
Lt.-Colonel ...	1,250 ...	1,100 + 240	= 1,340
Lt.-Colonel (after 25 years) ...	1,300 ...	.....	.....
Lt.-Colonel (selected list) ...	1,400 ...	1,250 + 240	= 1,490

In first and second class station hospitals, *i.e.*, in 77 hospitals, there is a *second in command allowance* of Rs. 120 or Rs. 90, which we may therefore add to the pay of, say, some Majors making (after 15 years' service) their pay Rs. 825 + 120 or Rs. 825 + 90, *i.e.*, Rs. 945 and Rs. 915, respectively, instead of the Rs. 900 rate given under the regimental system.

Till details of the strength of the staff of medical officers are given, it is not possible to know to what extent the Service, as a whole, is benefited; in any case men when not in charge or second in command will get usually the same pay as under the regimental system, and with luck will get more. Senior men, we presume, will usually draw charge allowances of first and second class hospitals, Majors and often Captains will command the third class hospitals. Lieutenants and junior Captains will usually be left pretty much as they were before. So-called "specialist pay" will continue as before.

The above rates can scarcely be called satisfactory at the present time, they are certainly not of such a nature as to attract recruits in the present state of the depleted medical profession at Home.

THE PASSING OF THE "BARRACK-ROOM WITH A CHARPOY."

It will be remembered that a distinguished officer once, and not long ago, described the hospital arrangements for Indian troops as a "barrack-room with a charpoy," and those who know the miserable regimental hospitals of the past thirty years must admit that that contemptuous description was not undeserved.

We are now, we are told by politicians and journalists, on the verge of a new era, and if we are not, we should be so. We may hope for a very different and very much improved scale of equipment for the station hospitals for Indian troops—when that long-delayed reform, appointing I. M. S. officers to station hospitals, is introduced.

Meantime something is to be done, as the following Army Instruction (No. 1279, of 5th November, 1918) will show:—

SCALES OF ACCOMMODATION FOR INDIAN STATION HOSPITALS.

It has been decided that under the Indian Station Hospital scheme the following scales shall govern the construction of new Indian station hospitals, and shall constitute a basis for the extension and adaptation of existing hospitals, to bring them, as far as possible, up to the standard of modern requirements. The erection of new hospitals, and the remodelling of existing hospitals, will be carried out in order of urgency and as funds become available. The scales are applicable to all hospitals of 10 beds and over.

(I) The number of beds will be divided as follows:—

	Per cent.
(a) Indian officers' wards ...	3
(b) Infectious wards ...	10
(c) Main wards ...	87

(II) The number of beds per ward in each of the above will be determined as follows:—

- (a) Up to 3 beds—in single wards.
4 beds and over—2 single wards and remainder in one or more wards.
- (b) Of the total number of beds allotted for infectious cases 10 per cent. are to be in single-bedded wards with a minimum of 2 single-bedded wards; in other wards a maximum of 6 beds in each ward.
- (c) Single wards.—Each ward of 14 beds and under will be provided with one separate single-bedded ward.
Two-bedded wards.—Each ward of 14 beds and over, *i.e.*, up to 28 beds in main ward, will be provided with one separate two-bedded ward.
Other wards.—Maximum of 28 beds in each.

(III) Sizes of wards:—

Single wards.—Floor area 164 } at one or both
sq. ft. per bed. } ends of the
Two-bedded wards.—Floor area } larger wards.
125 sq. ft. per bed.

Other wards, width 24'.—Wall space per bed $8\frac{1}{2}$ but increased to 10' where door intervenes between beds. A space of 5 feet must be given between the cross or end wall and the last bed of each row. A window or door to be given on either side of each bed.

(IV) Detail of wards:—

Verandahs 10' in the clear on all sides.
Doors 4 feet 6 inches opening in the clear.
Height of wards.—With flat roof verandahs 15'.
With pent roof verandahs 16'.

(V) Additional rooms for all main wards of 14 beds and over, *vide* item (I) (c):—

- (a) Convalescent day room.—252 sq. ft. fixed scale.
- (b) Milk room or milk safe.—On both floors in two-storeyed ward blocks, one in each ward, to be arranged in conjunction with ward offices. An impermeable floor to be provided. The room to be flyproof.

(c) Clean linen room.—128 sq. ft. fixed scale.

(d) Duty room.—128 sq. ft. fixed scale. A built-in wall cupboard to be provided for medicines.

(e) Lavatory for duty room.—32 sq. ft. fixed scale. For nurse where employed. One lavatory should serve 2 ward blocks on each floor.

(f) Ward scullery.—80 sq. ft. fixed scale. For preparation of special diets, cleaning, etc. A sink to be provided.

(VI) Additional rooms for all main wards of 3 to 12 beds:—

(a) Duty and dressing room.—168 sq. ft. fixed scale. A built-in cupboard to be provided for medicines.

(b) Lavatory for duty and dressing room.—32 sq. ft. fixed scale. *Vide* item (V) (e).

(c) Ward scullery.—80 sq. ft. fixed scale. *Vide* item (V) (f).

(d) Milk room or milk safe is to be given for every ward block, and on both floors in two-storeyed buildings. *Vide* item (V) (b).

(VII) (a) Bathrooms, } Provided in an annexe
number.—20 per cent. of } and connected with the
beds served, 10 per cent. } ward block by a covered
when water is laid on. Each } way and placed at one
30 sq. ft. minimum. } corner of the main ward.
(b) Soiled linen room.— } A space to be provided in
3 sq. ft. per bed, minimum } conjunction with bath-
32 sq. ft. } rooms for a portable bath.

(VIII) (a) Latrines 15 per cent. of the beds served.—
Each 18 sq. ft. 10 per cent. where water carriage system exists.

(b) A urinary of 2 compartments on each floor in larger blocks and 1 compartment in smaller blocks.

(c) Bed-pan room.—Where water carriage system exists, a special sink for cleaning bed-pans should be provided. A bed-pan cupboard should be constructed in the walls on the angle with through ventilation; to be flyproofed. } Provided in an annexe as above.

(d) Sweepers' room.—55 sq. ft. fixed scale, for sweepers on duty.

(e) Passage 4 behind.—Latrines, fixed scale, for sweepers' use.

(IX) Dining-room and kitchen block, with verandah 7' clear on one side only.—Three buildings for each 1st, 2nd, 3rd and 4th class hospital, one each for Hindus and Mohammedans and one for others. Two buildings for 5th class hospitals (for Hindus and Mohammedans, respectively). Each building to contain—

(a) Dining-room.—10 sq. ft. per bed for one-third number of beds in main wards. Minimum 80 sq. ft.

(b) Washing room.— $2\frac{1}{2}$ sq. ft. per bed. Minimum 32 sq. ft. To be provided with sinks as well as taps for washing eating utensils.

(c) Kitchen (10' × 15') for 20 to 50 }
bedded hospital. } Each kitchen
(15' × 20') for 51 to 100 } will be supplied
bedded hospital. } with a cooker
(20' × 20') for 101 to 150 } capable of cook-
bedded hospital. } ing for 25 to 100
(25' × 20') for 151 and } men.
over. }

(d) Scullery.— $1\frac{1}{2}$ sq. ft. per bed for one-third of the number of beds in hospital. Minimum 64 sq. ft.

- (e) Store room.—20 sq. ft. fixed scale } in verandah.
 (f) Fuel store.—28 sq. ft. fixed scale }
 (g) Cook's room.—35 sq. ft. fixed scale.

(X) Administrative block, with verandah 8' clear all round.

(a) Offices:—

Senior medical officer.—256 sq. ft. fixed scale. All hospitals.

Senior Sub-Assistant Surgeon.—256 sq. ft. fixed scale. All hospitals.

Clerks.—320 sq. ft. fixed scale for 101 beds and over.
 " 256 " " " scale. All hospitals of 26 to 100 beds.

Matron.—200 sq. ft. fixed scale. All hospitals of 151 beds and over, where nursing sisters are employed.

Records.—150 sq. ft. All hospitals of 51 beds and over. Fixed scale.

Laboratory.—256 sq. ft. fixed scale. All hospitals of 26 beds and over.

Medical Officer's duty and Board room.—256 sq. ft. fixed scale. All hospitals of 101 beds and over.

Medical Officer's bedroom.—200 sq. ft. fixed scale. All hospitals of 101 beds and over.

Bathroom or lavatory for Medical Officer.—64 sq. ft. fixed scale. All hospitals.

Sub-Assistant Surgeon's Day room.—256 sq. ft. fixed scale. All hospitals of 101 beds and over.

Bedroom.—144 sq. ft. fixed scale. All hospitals of 51 to 100 beds.

Bedroom.—200 sq. ft. fixed scale. All hospitals of 101 beds and over.

Bathroom or lavatory.—64 sq. ft. fixed scale. All hospitals of 51 beds and over.

Bathroom or lavatory for staff.—64 sq. ft. fixed scale. All hospitals.

(b) Out-patients, which may be in a separate building:—

Ophthalmic room.—152 sq. ft. fixed scale. All hospitals of 101 beds and over.

Examination room.—256 sq. ft. fixed scale. All hospitals of 26 beds and over.

Waiting room.—2 sq. ft. per bed with 144 sq. ft. minimum and 384 sq. ft. maximum floor space. All hospitals.

Minor surgery and dressing room.—1½ sq. ft. per bed, with 144 sq. ft. minimum and 384 sq. ft. maximum floor space. All hospitals.

(XI) Stores, with 8' verandah on one side only.

Store-keeper and Assistant's office.—256 sq. ft. fixed scale. All hospitals of 151 beds and over.

Store-keeper's office.—120 sq. ft. fixed scale. All hospitals of 51 to 151 beds.

Bedding store for surplus mattresses.—2 sq. ft. per bed. For hospitals of 151 beds and over.

Dressing store for storage of wools, lints, etc.—1½ sq. ft. per bed. For hospitals of 151 beds and over.

Ration store for meat and other fresh foodstuffs.—1½ sq. ft. per bed. For hospitals of 151 beds and over.

Extra store for any reserve stores of clothing in bales.—1½ sq. ft. per bed. For hospitals of 101 beds and over.

Field Service Equipment for medical and other mobilization equipment held on charge.—1 sq. ft. per bed. For hospitals of 101 beds and over.

Medical store for reserve supply of drugs, medical stores, etc.—¾ sq. ft. per bed. Minimum 80 sq. ft. For hospitals of 51 beds and over.

Dispensary 1½ sq. ft. per bed.
 Minimum 144 sq. ft.

Steward's store for hospital food supplies.—2 sq. ft. per bed.
 For hospitals of 151 beds and over, and 3 sq. ft. for all hospitals up to 150 beds.
 Minimum 80 sq. ft.

Pack store for patients' kit.—1½ sq. ft. per bed. Minimum 80 sq. ft.

Clean linen store for patients' linen, also bed linen, etc.—2 sq. ft. per bed for hospitals of 151 beds and over and 3 sq. ft. for all hospitals up to 150 beds. Minimum 80 sq. ft.

Soiled linen store for soiled linen awaiting disinfection, washing, etc.—1½ sq. ft. per bed. Minimum 60 sq. ft.

Oil and lamp store for cleaning lamps, etc., when necessary.—¾ sq. ft. per bed. Minimum 80 sq. ft.

(XII) Laundry block.—Steaming room.—¾ sq. ft. per bed.

Soiled clothes room.—¾ sq. ft. per bed.

Ironing room.—2 sq. ft. per bed.

Drying room.—1½ sq. ft. per bed, in verandah outside drying room.

Ironing and drying room.—3 sq. ft. per bed. Minimum 144 sq. ft.

Dhobie ghat.—One stone for 25 beds or less.

(XIII) Mortuary.—150 sq. ft. fixed scale.

Post-mortem room with verandah 8' on one side.—247 sq. ft. fixed scale.

(XIV) Infectious blocks.—One or two storeyed for all hospitals. Verandahs on all sides 10 ft. in clear.

Main wards. } See items (I) to (IV) and (VI).
 Single wards. }

Ward orderly or nurse's room.—108 sq. ft. fixed scale.

Nurse's bathroom.—48 sq. ft. fixed scale.

Or ward orderly bathroom in conjunction with bathrooms in annexe.—30 sq. ft. fixed scale.

Scullery.—(6'×12') 72 sq. ft. fixed scale.

Bathroom, one } in annexe, see item (VII).
 Soiled linen room, one } For each main ward.

Latrine.—2 seats in annexe, see item (VIII) (a).
 For each main ward.

Kitchen with verandah 5'.—Two, 80 sq. ft. each fixed scale.

Scullery.—64 sq. ft. fixed scale.

Store room.—20 sq. ft. fixed scale.

Fuel store.—20 sq. ft. fixed scale.

(XV) Indian officers' block.

Main Wards. See items (I) to (IV) with addition of day room 200 sq. ft. for all wards of four beds and over.

Single wards. Attendants' room 80 sq. ft. for each ward.

Bathrooms. In annexe, see item (VII). In an officers' block of 1 or 2 beds 1 bathroom is to be provided. Up to 10 beds 2 bathrooms, above 10 beds 20 per cent. of beds served.

Soiled linen room.

Latrine. In annexe, see item (VIII).

Bed-pan room. Number of latrines to correspond to number of bathrooms.

Sweepers' room.

Dining rooms and kitchens with verandah 5' one side.—Two blocks, one each for Hindus and Mahomedans, each connected with main wards by covered ways 7' wide and 27' long and containing—

Dining room 72 sq. ft. fixed scale with verandah 7' wide.

Washing room 40 sq. ft. fixed scale.

Kitchen 80 sq. ft. fixed scale.

Fuel store 21 sq. ft. fixed scale, in verandah.

Scullery 64 sq. ft. fixed scale.

Store room 20 sq. ft. fixed scale.

(XVI) Disinfecting block.—Only to be provided in stations where specially authorised, and is intended for use by the whole station.

Receiving room.—(20' × 20') 400 sq. ft. fixed scale.

Issuing room.—(20' × 20') 400 sq. ft. fixed scale.

Fuel store.—20 sq. ft. fixed scale.

Vansheds.—Two (24' × 14').—Required to shelter motor lorries. One for soiled and one for clean clothing where considerable distribution over the station is necessary. These sheds require special sanction.

(XVII) Operating theatre.—On the scale laid down in Army Instruction (India) No. 314 of 1918.

Theatre.—(24½' × 17') 406 sq. ft. fixed scale, with north light and window space 140 sq. ft. over.

Sterilization room.—(16' × 11½') 184 sq. ft. fixed scale.

Dressing room.—(16' × 11½') 184 sq. ft. fixed scale.

Anæsthetic room.—(18½' × 11½') 212 sq. ft. fixed scale.

Preparation room.—(13½' × 11½') 156 sq. ft. fixed scale.

With a verandah 8' in the clear on three sides.

X-ray room.—(22' × 14½') 320 sq. ft. fixed scale.

Developing room.—(14' × 10½') 150 sq. ft. fixed scale.

Store room.—(14' × 10½') 150 sq. ft. fixed scale.

With a verandah 8' in the clear on three sides.

Engine and battery room.—(25' × 16') 400 sq. ft. fixed scale. May be placed anywhere within convenient wiring distance, but should not be attached to the operating theatre building. Battery must be partitioned off from engine room as cleanliness is essential.

(XVIII) British detachment block.—This is a necessary addition to Indian station hospitals in all stations where no British station hospital exists and where British troops are located.

Officers and rank and file.—Number of beds 6 per cent. of the strength in the station.

Main wards.—4 beds and over on a similar scale as in Indian station hospitals.

Single wards.—165 sq. ft. one at each end of the main ward.

Annexes.—Two. As in Indian station hospitals.

Bathrooms, see item (VII), minimum 2—one for officers, one for rank and file.

Latrine, see item (VIII), minimum 2—one for officers, one for rank and file.

Night-soil receptacle room.

Sweepers' room. } As in Indian station hospitals.

Soiled linen room. }

Kitchen.—80 sq. ft. fixed scale with 7' verandah. } Connected with main block by covered way 7' wide and 27' long.

Scullery.—64 sq. ft. fixed scale with 7' verandah. }

Fuel store.—21 sq. ft. fixed scale, in verandah.

(XIX) Main outdoor Latrine.—Latrines 4 per cent. of total beds in main wards.

Urinary.—Compartments 2 per cent. of total beds in main wards.

INDIAN STATION HOSPITALS.

At long last the long talked of scheme for the introduction of the Station Hospital system is sanctioned, and details are given in Army Instruction (India) No. 1343 of 1918, dated Simla, 19th November, 1918.

The new classification of military hospitals shows that there will be 64 *first class* hospitals, 13 *second class*, 18 *third class*, 19 *fourth class*, and 33 of the *fifth class*.

The regulations now published are as follows:—

INTRODUCTION OF STATION HOSPITALS FOR INDIAN TROOPS AND FOLLOWERS.

It has been decided that, with effect from the 1st December, 1918, station hospitals for Indian troops and followers will be established in place of existing regimental and followers' hospitals.

2. Station hospitals for British troops will thereafter be known as "British station hospitals" and those for Indian troops and followers as "Indian station hospitals."

3. The system of command and administration in Indian station hospitals will be similar to that in hospitals for British troops.

4. All existing hospital arrangements for Indian troops and for regimental and departmental followers will be brought under one administrative control which will be exercised by the officer commanding the Indian station hospital. Officers of the Indian Medical Service, sub-assistant surgeons and subordinate hospital establishments will no longer be attached to Indian regimental units, but will form a part of the establishment of Indian station hospitals.

5. Hospitals will be classified according to the total strength of Indian troops and followers forming the garrison as follows:—

First class Indian station hospital, where the strength of garrison (as above) is 3,000 and over.

Second class Indian station hospital, where the strength of garrison (as above) is 2,000 and over.

Third class Indian station hospital, where the strength of garrison (as above) is 1,000 and over.

Fourth class Indian station hospital, where the strength of garrison (as above) is 500 and over.

Fifth class Indian station hospital, where the strength of garrison (as above) is under 500.

The present classification of Indian station hospitals, which is only temporary, is shown in appendix "A" to this instruction. The permanent classification of hospitals will be carried out on the restoration of normal conditions.

6. Where more than one regimental, or combined, hospital already exists in a station, the local authorities will decide, and report to the Director of Medical Services in India for the information of the Government of India, which will be the Indian station hospital. The remaining outlying hospitals, which it is necessary to retain, will be designated and administered as section hospitals of the station hospital. The officer commanding station hospital will be in command of, and administer, all such section hospitals. Section hospitals will be supplied with equipment, medical stores and stationery from the station hospital.

7. For the period of the war, and until further instructions are issued, the Director, Medical Services in India, will appoint officers to command all first class Indian station hospitals and the hospitals at the following stations:—

Bakloh.	Shillong.
Dharmasala.	Maymyo.
Almora.	Mandalay.

Commanding officers of other hospitals will be appointed by the General Officer Commanding, Command or Independent Division, who will also appoint officers as second in command of all first and second class station hospitals.

8. The rules governing the pay and allowances of officers of the Indian Medical Service are laid down in appendix "B" to this instruction.

9. Deputy and Assistant Directors, Medical Services, Divisions and Independent Brigades, will appoint sub-assistant surgeons to the sub-charge of all Indian station hospitals.

Revised rates of sub-charge allowances for sub-assistant surgeons will be announced hereafter.

10. Ward orderlies will be attached to regimental units for purposes of pay, clothing and rations, as at present. Details as regards the appointment, pay and promotion of ward orderlies are given in appendix "C" to this instruction.

11. Orders will be issued shortly regarding the formation of a new corps to be designated the Indian Hospital Corps. This corps will combine, in one organization, the Army Bearer Corps, the Army Hospital Corps and the subordinate personnel of Indian station hospitals.

12. Temporary hospital writers and store-keepers will be engaged on the scales laid down in appendix "D" in which the rates of pay of store-keepers are given. These scales are in supersession of those laid down in Army Instruction (India) No. 1231 of 1918. Writers should be paid at the lowest rates on which they can be obtained. Both classes must sign the agreement on I. A. F. Z. 2255, the words "on field service or" in line 12 of the agreement, and "either" and "or out of" in line 13, being deleted in ink and initialled by the officer commanding hospital.

13. All existing regimental hospital followers and menial personnel of followers' hospitals, will, if they are willing, be temporarily transferred, together with their documents, to the Indian station hospital at the station in which they are serving. If not willing to be

thus transferred, they will be discharged unless they are pensionable servants, when each individual case will be reported to the Director, Medical Services in India, for orders. The scale on which followers will be employed is laid down in appendix "E." If in order to complete this scale it should be necessary to recruit personnel in addition to those transferred from regimental establishments, these should be engaged temporarily at the lowest rates of pay on which they can be obtained. The scale of clothing for all hospital followers (including those now serving) is given in appendix "E."

14. The instructions contained in Army Regulations, India, Volume VI, and Standing Orders for the Military Medical Services, regarding the duties of officers of the Royal Army Medical Corps and assistant surgeons will be generally applicable to officers of the Indian Medical Service and sub-assistant surgeons.

Particular attention must be paid to the detailing of officers and sub-assistant surgeons for medical and sanitary duties, outside hospitals, in connection with the various units in each station, and for orderly duty.

15. Postage labels will be supplied to officers commanding Indian station hospitals by the Divisional or Brigade Deputy or Assistant Director, Medical Services, in the manner at present in force in the case of British station hospitals. Any funds required will be arranged for by the General Officer Commanding concerned, in consultation with the Controller of Military Accounts.

16. Officers commanding Indian station hospitals will exercise the same financial powers as Senior Medical Officers, Indian Medical Service [Army Regulations, India, Volume III, paragraph 6 (vii)].

17. The allotments at present made by the Deputy and Assistant Directors, Medical Services, to Senior Medical Officers, Indian Medical Service, to meet contingencies, and for the purchase of articles of local supply, will, in future, be made to officers commanding Indian station hospitals.

18. The pay of officers of the Indian Medical Service, sub-assistant surgeons and hospital establishments will be drawn in accordance with the rules laid down in "Instructions, Staff" for drawing the pay of officers of the Royal Army Medical Corps, assistant surgeons and men of the Army Hospital Corps.

19. Pending the provision of pack stores in Indian station hospitals, Indian soldiers and followers, when admitted to hospital, will have with them only their chevrons, boots, *lotahs*, and the necessary cleaning materials. All other articles of clothing and equipment will, on the day on which a man is admitted to hospital, be removed and retained under regimental arrangements.

The officer commanding Indian station hospital will furnish the officer commanding unit with the names of all men who are to be discharged from hospital one day prior to their discharge. The officer commanding unit will return the men's clothing to hospital on the morning of the day of discharge.

20. Pending further orders the most suitable arrangements must be made for carrying on the station hospital system in existing permanent or temporary hospital buildings expanded by the provision of such temporary buildings as may be sanctioned on representations made to the Director, Medical Services in India.

21. Indian station hospitals will be dieted institutionally, the scales of diet being as authorised in Army Instruction (India) No. 1277 of 1918. The necessary additional furniture and equipment have been sanctioned on a provisional basis in Army Instruction (India) No. 1231 of 1918. Pending the issue of revised scales of medical and surgical equipment, the equipment at present allowed will be continued in use.

22. The necessary amendments to regulations will be issued in due course.

PROVISION OF ADDITIONAL EQUIPMENT FOR FIRST AND SECOND CLASS BRITISH STATION HOSPITALS.

It has been decided that in order to effect general improvement in the standard of comfort and efficiency in the first and second class British station hospitals located at the stations enumerated in appendix VI (1), Army Regulations, India, Volume VI, equipment for these hospitals shall be provided on the revised scales. Steps should be taken immediately to complete the equipment of the wards in accordance with these scales subject to the condition that, before new patterns are introduced, existing patterns must first be fully utilised.

2. The expenditure involved is estimated at Rs. 2,38,833 initial and Rs. 23,883 annual recurring, and should be treated as pertaining to the schedule measure "Provision of additional equipment for first and second class British station hospitals" and met from the provision of Rs. 10 lakhs in this year's Military Works estimates for special (B. I. No. S.-15) demands.

3. Sanction is hereby accorded to the transfer from the head "47—Military Works—Special," of a sum of Rs. 1,08,997 to the head "46—Army," under the grants and heads shown in appendix B to this instruction, to meet the Army initial expenditure during the current financial year.

			Initial. Rs.	Recurring. Rs.
Army	...	...	1,08,997	10,900
Military Works	...	...	1,29,836	12,983
Total	...	...	2,38,833	23,883

CHILD-BIRTH CONDITIONS IN INDIA.

THE report of what is called the "Victoria Memorial Scholarships Fund" has just been issued in a volume of 162 pages, and contains much of interest. The unhappy conditions of child-birth among Indian women have been a concern to many since Lady Dufferin first began her endeavour to provide lady doctors for India. Puerperal sepsis and osteomalacia are very prevalent and deadly, and the ignorance as to artificial methods of infant feeding leads to the extremely high infantile mortality in India.

Recognition of these facts in 1903 led to the formation by Lady Curzon of the Victoria Memorial Scholarships Fund. The money collected was to be applied to the proper training of the "hereditary" (?) *dai* class of women. A sum of near seven lakhs was collected, giving an annual income of Rs. 34,000, which was distributed among the different provinces.

The new movement was not successful and the instruction attempted was mainly theoretical. Many of the midwives were old women, "some were deaf and some were blind," and they were deeply of opinion that there was little for them to learn! We may here quote from the report itself:—

Improvement of the conditions of child-birth in India is a problem at least as difficult and at least as important as the prevention of plague; and it is only by patient work frequently unsuccessful and experiments constantly repeated that a successful issue can be expected. In time to come the thanks of India will no doubt be given to those who have shown by practical experiment that supervision of hereditary *daïs* is not

only desirable, but possible. In this connection the Committee would particularly mention the names of the late Miss Hewlett, of Amritsar; Dr. Agnes Henderson, of Nagpur; Dr. Gertrude Stuart, of Quetta; and Dr. Maud Allen, of Ferözepore, as deserving the gratitude of the women of India.

As regards the class of women to be trained, the Committee feels the warmest interest in all efforts to train and assist midwives of a superior class, but it feels that, until proof is given that the majority of women in a province, rich and poor alike, are employing these midwives for natural labour, the funds of the Victoria Memorial Scholarships must be expended entirely for the improvement of the hereditary *dai* class.

The Committee hopes that the opinions given will be carefully considered alike by Local Governments, sanitary experts, medical women, and midwives.

It is felt that more might be done both by the Imperial and Local Governments to relieve the terrible conditions, the suffering, and loss of life endured by so large a section of the population.

Statistics show that in recent years the birth-rate in India has been falling, with a tendency for the death-rate to rise. If the wastage of infant life is to be taken in hand the first step is undoubtedly improvement of the conditions of child-birth. Measures to provide milk depôts, crèches, and baby clinics are of little use to children who die before or during birth, or within the first month after.

One very evident fact is the lack of statistics relating to child-birth. It ought not to be more difficult to discover the number of deaths following child-birth than the number following plague, and the discovery that certain cities were peculiarly affected in this way could be used as a strong incentive to their municipalities, and to their principal residents, to effect improvements.

The Committee hopes that medical women will do what they can to carry out some of the suggestions made for improvement. Some will no doubt prove difficult or impracticable, others may be unexpectedly easy; but the Committee hopes that medical women will send information as to success or non-success, and from time to time further ideas and suggestions which may be of service.

A point regarding which there is much difference of opinion is whether work among the hereditary *dai* class should be continued, or whether it should be given up and all effort concentrated on providing a better class of midwife. There is a general agreement that this last would be the simplest and easiest solution of a difficult problem; but while the Surgeon-General and other officers of the Indian Medical Service in Bengal and the Inspector-General, United Provinces, give a definite pronouncement that this course should be followed, the majority of the medical women who discuss the question declare it impossible as a practical measure. It is true that, as pointed out time and again in the annual reports, the hereditary class is unwilling to be taught, makes unsatisfactory pupils and often after training is no better than before; while women of other classes are obedient and amenable, may have some education, and absorb new ideas readily. On the other hand, it is stated that it is impossible at present to get a sufficient number of educated Indian women to replace indigenous *daïs*. It may be possible in the capital cities, but it is not possible throughout the districts of India, where the population is scattered over wide areas and where women are being sought for in vain to take up posts as compounders, nurses, teachers, etc. Next it is argued that a woman of higher class expects a fee much larger than the

middle and low class Indian family is as a rule prepared to give. She is also unwilling to do all the work in the house the hereditary *dai* is expected to do, and this forms a very practical obstacle to her employment in poor families. In many cases trained midwives have been retained by municipalities and it has been found that they attended few cases of natural labour even after years of work; and this even though the people were quite ready to look upon them as doctors and call them in for abnormal cases.

Some claim that the hereditary *dai*, when young, is found to be adaptable, intelligent, and willing, with a certain hereditary instinct for her work which, other things being equal, makes her a better pupil than the women of other castes.

The opinion of most of the medical women, therefore, is that for general improvement of child-birth in India work amongst hereditary *daïs* must be continued, but that it is useless unless it is combined with some scheme of supervision of their work by means of midwife supervisors.

Objects of the Fund.

The objects of the Fund have now been defined to be—

(1) To train midwives in the female wards of hospitals and female training schools in such a manner as will enable them to carry on their hereditary calling in harmony with the religious feelings of the people, and gradually to improve their traditional methods in the light of modern sanitation and medical knowledge.

(2) Scholarships to midwives will vary according to circumstances and locality.

(3) When desirable, qualified female teachers, who understand the vernacular, will be sent to outlying districts, and fees will be paid to midwives who attend a course of elementary instruction.

(4) Funds for the above purpose will be granted, as far as possible, according to the interest received on the sums raised in each locality.

WOMEN'S MEDICAL SERVICE FOR INDIA.

THE following rules for the Junior Branch of the Women's Medical Service for India have recently been published by the Central Committee of the Countess of Dufferin's Fund.

1. This service shall be called "The Junior Branch of the Women's Medical Service for India." It shall be included in the National Association for supplying female medical aid to the women of India, hereinafter called the Countess of Dufferin's Fund, and shall, subject to the provisions of the following rules, be under the direction and control of the Central Committee of that Association, hereinafter called the Central Committee.

2. Recruitment for the service shall be made by a sub-committee of the Central Committee which shall include the Director-General, Indian Medical Service, the Honorary and Joint Secretaries to the Central Committee.

This sub-committee shall perform the duties of a medical board, examine candidates for physical fitness, and give permission to return to duty after periods of invaliding: provided that the sub-committee may, by general or by special order, delegate their powers to temporary boards of local medical officers, medical women being included in cases of recruitment, invaliding and return to duty after sick leave.

3. Each candidate selected for the service must fulfil the following requirements:—

- (a) She must be a British subject resident in India.
- (b) She must possess a medical qualification registrable in the United Kingdom and in India.
- (c) She must be between the ages of 24 and 30 years.
- (d) She must be unmarried or a widow.
- (e) She must produce a certificate of health and moral character.

Provided that the Central Committee shall, at any time, have power to promote to the service ladies not fulfilling the above conditions but who have shown marked capacity.

4. Members of the Service shall be appointed by the Central Committee to serve in the several provinces.

5. Members of the Service on appointment shall engage for general service anywhere in India and Burma, and shall serve a probationary period of one year.

At the end of such period of probation their appointment shall be confirmed or terminated, as the case may be, by order of the Central Committee on the report of the Provincial Committee of the Countess of Dufferin's Fund, hereinafter called the Provincial Committee, after consultation with the authority or authorities financially concerned. (*Vide rule 7, infra.*)

After confirmation, service shall, at any time, be terminable on three months' notice on either side, and the Central Committee shall have power to dispense with the services of any member of the Service on the payment of three months' salary in lieu of notice.

6. Members of the Service shall receive their pay and allowances from the Central or Provincial Committees of the Countess of Dufferin's Fund. Each Hospital Committee employing a member of the Service shall pay a contribution to the Central Committee for salary, provident fund, etc., to be decided on by the Provincial Committee in consultation with the authority financially concerned.

7. Members of the Service shall be graded and paid as follows:—

Grade.	Length of service.	Salary.
4th grade ...	1—5 years ...	Rs. 130 per mensem.
3rd " ...	6—10 " ...	" 165 "
2nd " ...	11—15 " ...	" 200 "
1st " ...	16 " ...	" 250 "

There are in addition several senior posts drawing pay at the rate of Rs. 300 per mensem, to which members of the Service will be appointed by selection.

8. Members of the Service shall be required to attend post-graduate courses at the end of the 5th and 10th years of service, and shall be promoted to the 3rd and 2nd grades on the receipt by the Central Committee of a satisfactory report of their progress from the board of post-graduate lecturers. Promotion to the first grade shall take place automatically on the receipt of a satisfactory report from the Provincial Committee under whom she is serving at the end of fifteen years' service: promotion to the senior grade shall be made by the Central Committee from among the members of the 1st grade and by selection only.

Where a medical woman who has previously served is admitted into the junior branch, Women's Medical Service, the Central Committee may, if they consider it necessary, grade her for purposes of pay and promotion as if the whole or any part of her previous medical work had been carried out in the junior branch Women's Medical Service.

9. Furnished quarters shall be provided at a house-rent allowance in lieu thereof the amount to be decided on between the Provincial Committee and the authority financially concerned.

Members of the Service shall be entitled to travelling allowance on the same scale and subject to the same rules as out in Appendix I.

10. Members of the Service shall be entitled to leave according to the regulations set out in Appendix II to these rules.

11. Members of the Service shall join a Provident Fund on the terms and subject to the conditions set out in Appendix III to these rules.

12. Members of the Service shall be permitted to engage in private practice, provided that such private practice does not interfere with the performance of their official duties.

The Provincial Committee shall have power to decide in any case, after consultation with the authority or authorities financially concerned (*vide* rule 7, *supra*), whether private practice does in fact interfere with the performance of official duties.

13. Members of the Service shall retire on attaining the age of 55 years, unless the Central Committee, on the recommendation of the Provincial Committee, after consultation with the authority or authorities financially concerned (*vide* rule 7, *supra*), desire to retain their services for a further period to be determined by them.

14. When appointed to a province, members of the Service shall forthwith become subordinate to the Provincial Committee in all matters, and they shall not correspond with the Central Committee except through the Provincial Committee.

15. The Provincial Committee shall have powers of disciplinary control over members of the Service, including suspension, but powers of removal or dismissal for inefficiency, misconduct or other valid cause, shall be vested in the Central Committee only.

16. When a member of the Service is attached to a hospital or other institution whose medical Superintendent is a member of the Senior Women's Medical Service, she shall be subordinate to that Superintendent, and her correspondence with the Provincial Committee shall pass through the Superintendent.

When a member of the Service is attached to a District or Municipal Hospital, she shall be subordinate to the Civil Surgeon of the district, and her correspondence with the Provincial Committee shall pass through his hands.

17. The Central Committee shall have power, in communication with the Provincial Committee, to depute any qualified person or persons to inspect members of the Service and the hospitals or other institutions under their charge.

18. The decision of the Central Committee shall be final in all cases.

19. The Central Committee reserve power to alter these rules from time to time after consultation, where necessary, with Local Governments and Provincial Committees.

AIR DISEASES.

ARMY Council Instruction No. 586 of 1918, dated War Office, 25th May, 1918, runs as follows:—

NOMENCLATURE OF MORBID CONDITIONS DUE TO FLYING.

1. Cases of sickness attributable to flying will be recorded on the Field Medical card, Admission and Discharge Books and all medical records under the heading "Flying Sickness" which will be regarded as a short synonym for morbid conditions due to flying, with the nature of the sickness added in accordance with the following nomenclature:—

Flying Sickness.

- A. Sickness at High Altitudes.
- B. Fainting in the Air.
- C. Cardio Vascular Debility.
- D. Exhaustion.

E. Vomiting.

F. Vertigo.

Thus, an airman admitted for vertigo will have his disease recorded as "Flying sickness (F)" or "Flying sickness, Vertigo"; similarly an admission for fainting in the air will be "Flying sickness (B)" or "Flying sickness, Fainting in the Air"; an admission for sickness at high altitudes "Flying sickness (A)" or "Flying sickness, Sickness at High Altitudes"; and so on.

This nomenclature will come into force forthwith.

THE following Army Department notification, which was published in the *Gazette of India*, dated the 18th October, 1918, is reproduced for information:—

The Governor-General in Council is pleased to notify that the Right Hon'ble the Secretary of State for India has decided that, with effect from the 2nd October, 1918, the Indian Subordinate Medical Department shall be designated the Indian Medical Department.

PROVISION OF BAMBER OIL AS A PROTECTION AGAINST MOSQUITO BITES.

Sanction is accorded to the issue, at the discretion of Divisional and Brigade Commanders for the use of men on guard, of bamber oil, consisting of oil of citronella, coconut oil, kerosene oil, and carbolic acid, as a culecide and sandfly deterrent, instead of the drugs mentioned in India Army Order No. 1191 of 1917.

2. Bamber oil will be prepared in hospitals and will be issued "as required."

3. The expenditure involved, which is estimated at Rs. 9,877-10-3 annual recurring, is debitable to the ordinary grant and head of account affected in the Army Estimates.

GRANT OF FREE MEDICAL ATTENDANCE TO THE WIDOWS AND CHILDREN OF OFFICERS DURING THEIR ENFORCED DETENTION IN INDIA.

With the approval of the Right Hon'ble the Secretary of State for India, it has been decided that the widows and children of officers (including officers with honorary rank and chaplains), referred to in India Army Orders 1036 of 1917 and 7 of 1918, and Army Instruction (India) No. 778 of 1918, shall, during their enforced detention in India owing to present restrictions on sea travelling, be granted free medical attendance to the extent to which they were entitled to such attendance when the heads of families were alive, under Army Regulations, India, Volume VI, paragraphs 67 and 67-A.

2. No charges are involved on account of fees for the medical attendant. The cost of medicines, etc., will be debitable to the ordinary grant and head of account affected.

SCALES OF DIET FOR INDIAN TROOPS' AND DEPARTMENTAL FOLLOWERS' HOSPITALS.

The issue of free diets on a tentative scale is sanctioned for the sick of the various Indian Corps (all arms) and departmental and regimental followers under treatment in Indian troops' and departmental followers' hospitals.

2. All diets and extras should be accounted for by the officer commanding the hospital in India Army Form Z-2108 which should be submitted to the Divisional Controller concerned.

3. During the period of the war, hospital stoppages will not be recovered except as laid down in India Army Order No. 836, dated the 17th September, 1918.

4. The procedure laid down in Army Regulations, India, Volume II, paragraph 883, will be applicable to those who are entitled to free rations. Those not drawing free rations will not be entitled to free hospital diet until the day following that on which they are marked "hospital" on Army Form A.-27. The extras noted in Army Regulations, India, Volume VI, paragraph 114, are admissible on the day of admission to, or detention in, hospital.

5. The necessary amendments to Army Regulations, India, and the forms concerned will be published in due course.

6. Separate orders will be issued regarding the incidence and allocation of the expenditure involved as

well as the source from which it will be met during the current financial year.

THE SIR LEONARD ROGERS' BUST FUND.

The following statement shows the accounts of the Fund for the setting up of a marble bust of Sir Leonard Rogers, F.R.S., F.R.C.P., C.I.E., I.M.S., in the hall of the School of Tropical Medicine in Calcutta. It is proposed to found a Silver Medal in the school with the balance in hand, *viz.*, Rs. 745.

PORTRAIT (BUST) FUND.

<i>Receipts.</i>		Rs. A. P.
To Amount received by Subscriptions	...	4,433 12 0
„ Interest	...	76 2 2
		<hr/> 4,509 14 2
To Balance in hand brought down	...	745 3 8

<i>Disbursements.</i>		Rs. A. P.
By Cash paid to G. K. Mhatre for bust, etc.	...	3,471 14 0
„ Postage	...	55 9 6
„ Discount on Up-country Cheques	...	9 2 0
„ Miscellaneous Expenses	...	223 1 0
„ Balance in hand carried down	...	745 3 8
		<hr/> 4,509 14 2

CALCUTTA,

4th December, 1918.

THACKER, SPINK & CO.

Reviews.

The Medical Annual, 1918.—By various Authors. Bristol: Messrs. John Wright & Sons, Ltd. Price, 10s.

As an epitome of the recent advances in medical science the Medical Annual for 1918 fully maintains the high place in medical literature which this series of publications has long occupied.

The general arrangement of the subjects dealt with is too well known to need a description here. Suffice it to say that it comprises over 700 pages packed with medical and surgical information of all kinds.

The world war and the medical and surgical problems connected therewith has resulted in the production of an enormous amount of original work relating to the injuries and diseases peculiar to campaigning in different parts of the globe. The sifting of the mass of available material has been carried out by writers of repute in the medical world, and a careful perusal of the articles he is interested in, will well repay the reader.

Among the articles which deserve special attention are the following:—

An article by Mr. Thurston Holland on radio-activity and electro-therapeutics. This includes a discussion of the most approved methods of localising foreign bodies. Attention may also be directed to a description of Finzi's skin marking solution, a new method for X-ray delineation of the pituitary fossa, the use of X-rays in diagnos-

ing gas gangrene, and a discussion of the value of X-rays in the diagnosis of gastric cancer.

The general treatment of wounds is discussed by Surgeon-General Wildey. He describes the conditions under which primary suture may be performed, the most important precaution being the removal of all fragments and injured tissues.

The subject of gas gangrene is dealt with by the same author. He emphasises that it is a disease of the muscle tissues and follows on the action of anaerobic saprophytes of faecal origin. Treatment resolves itself into removal of the affected tissues and continuous irrigation with antiseptic solutions.

The influence of prophylactic injections of anti-toxic serum in tetanus should be noted. It has caused a reduction in the number of cases of tetanus in proportion to the number of wounded from 1.6 per cent. to 0.2 per cent.

Injuries to the jaws and face are dealt with by Mr. W. H. Dolamore. He describes various ingenious methods by which the most ghastly disfigurements are removed or mitigated. The methods described include bone grafting and the wearing of special masks and spectacles.

Gun-shot wounds of the abdomen are discussed by Dr. E. Wyllys Andrews. He points out the difficulty in determining whether the bullet has penetrated a hollow viscus or not. The importance of rest in bed and stimulants in pulseless patients before attempting operation is insisted on.

Other articles dealing with war injuries and diseases are:—

Gunshot wounds of nerves; wounds of the brain and spinal cord; and shell shock, by Dr. Ramsay Hunt.

Soldiers heart, by Dr. Carey F. Coombs.

Trench fever, by Dr. Goodall.

Trench throat, by Dr. J. S. Fraser.

Eye injuries, by Dr. Hugh Thompson.

The articles on tropical diseases by Sir Leonard Rogers will be read with interest by the medical profession, not only in India but all over the world. Continued good results are recorded from the injection of tartar emetic in kala-azar, and use of emetine in amoebic dysentery.

Dr. A. Latham describes a new method of treating asthma by injection of a solution of peptone at intervals of from three to seven days. He also mentions the use of optochin (ethyl-hydrocuprein) in pneumonia, 0.25 gm. (3 to 4 grs.) may be given every four hours.

Dr. Wm. E. Fothergill reports on the scopolamine and morphia method of producing twilight sleep during labour. He states that it is generally agreed that the method is most suitable for maternity homes where patients can be attended by a medical man who devotes his whole time to it.

Dr. C. F. Marshall discusses the relative values of the lutein test and the Wassermann reaction in the diagnosis of syphilis. The lutein test is regarded as more specific unless the patient has been taking potassium iodide.

In connection with the diagnosis and treatment of cerebro-spinal fever, a special article on lumbar puncture by Dr. Ramsay Hunt should be carefully perused.

Typhoid and paratyphoid fevers are discussed by Dr. Goodall. In both these diseases intramuscular and intravenous injections of peptone have been used with benefit.

Among skin diseases, Dr. E. Graham Little describes the treatment of Impetigo contagiosa by lotio hydrarg. perchlor. (1 in 6,000) followed by white precipitate ointment.

Mental diseases are dealt with by Drs. Bedford Dierce and Kate Haslam. Among other things it is suggested that neurasthenia, asthma, and depression are due to chronic infection with the influenza bacillus in association with other organisms such as micrococcus catarrhalis and the pneumococcus, and that treatment with sensitised vaccines is curative.

In a short note of this nature it is impossible to do more than mention some of the more interesting features of a work which rightly claims to cover the whole province of medicine and surgery. From a careful perusal of its pages we can safely conclude that no medical library should be without this excellent summary of recent advances in medical and surgical science.

An Index Prognosis and End Results.—Edited by A. RENDLE SHORT, F.R.C.S. Second Edition, revised and enlarged. Bristol: John Wright & Sons, Ltd., London. Simpson Marshall, 1918.

WE are glad to see a new edition of this valuable book. We gave the first edition a very hearty welcome and extend the same to this revised and enlarged edition. The account of tropical diseases is in the safe hands of Sir Leonard Rogers. The contributors are well-known men, and each writes on his own special subject.

To set forth the results, and especially the end results, of various methods of treatment is most useful, and in this respect the book is unique. There is an unusually ample index, and the subjects are arranged alphabetically.

We have no hesitation in recommending this valuable and helpful book to our readers.

War Wounds of the Lung.—Notes on their Surgical Treatment at the Front. By PIERRE DUVAL. Authorised English translation.

THIS small volume, running to less than a hundred pages, deals with the vexed question of the treatment of war wounds of the lung. It consists of a collection of notes made by the author and his colleagues when on field service. It is pointed out that the main principle to be borne in mind is the complete and absolute resemblance between gunshot wounds of the lung and of muscle. The characteristics, *i.e.*, area of dead, traumatized tissue, zone of hæmorrhagic infiltration, etc., are the same as in other battle wounds, and, in the author's opinion, must be treated on exactly the same lines. Hæmorrhage and mechanical asphyxia are the chief causes of the appalling early mortality that makes the subject of such extreme importance. The book is well written and the illustrations are excellent.

War Neuroses.—By JOHN J. MACCURDY, M.D. Cambridge: University Press, 1918.

THIS is a very interesting book, and in it an expert describes his experiences of the special forms of neurosis which are produced by the shocks and strains of warfare, the great frequency of which in the great war which has just ceased, has made what was formerly a narrow speciality familiar to all practitioners of medicine.

Dr. MacCurdy points out that whereas the neuroses of civil life hinge upon factors connected with the complicated instincts of sex, those of war are much simpler and depend essentially in the coming into play of the relatively simple instinct of self-preservation.

The book is divided into eleven chapters, and deals with typical cases which are particularly well chosen, with "anxiety states," "mental make up," fatigue, concussion, conversion, neuroses and heart neuroses with a useful chapter on prophylaxis.

The term "anxiety states" is used by the author to designate one of the two clinical groups, for the reason that anxiety is the most prominent and consistent feature in the clinical picture. These cases resemble what is often called "neurasthenia" in civil practice, and we recommend this chapter especially to our readers.

The cases coming under the head "concussion" are ably discussed and explained. We can strongly recommend this useful book. It will prove of much value to medical officers in charge of war hospitals in India.

ANNUAL REPORTS.

CALCUTTA HEALTH REPORT, 1917.

THIS is a big report, and we have no space to refer to very many interesting items in it. We make, however, a few selections of special interest.

The death rate in 1917 was 23 per mille, the lowest on record, but calculated on an hypothetical population based on the Census it works out at 28.1 per mille. The infantile mortality rate was for the whole city 239 per thousand births, many due to bronchitis, "congenital debility" (?) and tetanus. The birth rate is given as 20.9 per mille. Still-births, mainly due to syphilis, were no less than 1 out of every 17 births.

Plague only caused 81 deaths in the year.

Cholera caused 866 deaths, and was at its worst in April and May. Tolly's Nullah is called "that notorious haunt of cholera."

Small-pox only caused 28 deaths.

Measles, which seems to prevail every third year, caused 138 deaths.

Enteric fever is credited with 209 deaths, mainly in August and September.

A good account is given of a local outbreak in a convent—20 cases, but only two deaths. A servant was suspected to be the "carrier".

To *malaria* are attributed 984 deaths (1.1 per mille).

Bowel complaints caused 2,577 deaths, or 2.9 per mille.

Tuberculosis, though certainly a very important cause of death, is credited with 1,539 deaths (or 1.7 per mille), and it is said to be now 30 per cent. lower than it was five years ago.

Influenza is not mentioned, but "respiratory diseases caused over 5 per mille of the death rate."

Ghee adulteration.—Our readers may remember the sudden sanitary impulse which led to the rapid passing of a special Act (September 1917). On its working Dr. Crake remarks:—

From the commencement of the new Act up to the end of the year under review 308 samples of ghee were analysed, of which 83 samples were obtained from wholesale dealers and 225 from retail vendors. Eighteen of

the wholesale dealers' samples and 40 of the samples from retailers were found adulterated; 55 prosecutions were instituted during the year for selling adulterated ghee, of which 17 were against wholesale dealers and 38 against retail traders. Convictions were obtained in 12 cases, the fines inflicted amounting to Rs. 1,214; 38 cases were pending at the close of the year, and 5 cases were struck off or otherwise disposed of. One case was instituted for keeping adulterants in a ghee godown and was pending. The number of prosecutions instituted for refusal to sell samples of ghee for analysis was 11; of these 7 were decided during the year, the accused being fined Rs. 830, and 4 cases were pending when the year closed. A big consignment of ghee consisting of 369 maunds were seized at a shop and godown in Cotton Street, and was ordered by the Municipal Magistrate to be destroyed to my satisfaction. The ghee was sold to the North-West Soap Company and was immediately alkalisied in the presence of a Food Inspector. The sale proceeds will be made over to the heirs of the original proprietors after deducting all the incidental expenses to which the Corporation were put. The Food Inspector, Dr. S. N. De, deserves to be congratulated for his promptitude in following up the result of analysis by seizure, for his successful conduct of the case in Court and for his vigilance during removal and at the time of alkalisiation.

Anti-malarial work.—On the work of the anti-mosquito brigade, Dr. Crake writes:—

Besides the above work, nearly 300 cesspits were treated several times, and in 169 cases obstructions to surface drains were removed in District III. In District IV, 3,552 children were examined and 146 cases of enlarged spleen were discovered, a spleen index of over 4 per cent. This is considerably higher than the figure given last year (2.8 for Wards 21 and 24). In connection with the proposal for the extension of the Lansdowne Road, an investigation was made to ascertain the sanitary condition of the area, and out of 484 children examined in October and November 1917, 65 had enlarged spleen giving a spleen index of over 13 per cent. These facts support my contention that there is more malaria in District IV than appears from the vital statistics.

From the more complete records kept in the district (every tank being examined regularly all the year round), it will be seen that there is a marked seasonal variation in the prevalence of anopheles. Broadly speaking anopheles are most prevalent in the cold season and least prevalent in the rains. The largest number of breeding grounds were found in December and the smallest in August. A great deal of useful work is carried out by the mosquito brigades, but it must be clearly understood that the present staff is really a nucleus on which I hope a complete organisation will gradually be built up.

BIHAR AND ORISSA HOSPITAL'S REPORT.

THIS big report is mainly statistical and there is but little which lends itself to extraction.

Tubercle of the lungs.—The number of cases treated for tubercle of the lungs increased from 4,021 with 95 deaths to 5,012 with 96 deaths. The increase may possibly be ascribed to better diagnosis. The tuberculosis ward at the Bhagalpur Sadr Hospital, which was under construction in 1916, has now been completed. Those at Chapra and Bankipore will be built soon. The Local Government have been pleased to sanction the construction of similar wards at Gaya and Muzaffarpur also for which funds have been provided in the current year's budget.

Leprosy and Leper Asylums.—Leprosy gave practically the same number of admissions at the hospitals and dispensaries as in the preceding year, viz, 2,802 against 2,795, while the resident lepers treated in the eight leper asylums in the province numbered 1,373 against 1,337 in 1916. The number of beds available for leper inmates also remained almost the same. The decrease of 41 beds at Purulia was counterbalanced by the increase of 36 beds at Gaya. The total expenditure incurred on maintaining all the asylums amounted to Rs. 90,529 as compared with Rs. 87,207 in the previous year. In 1917 Government contributed towards the expenditure in connection with these asylums a total sum of Rs. 49,463, including a lump grant of Rs. 25,000 for improvements to the King Edward VII Memorial Leper Asylum at Gaya. The detailed scheme for the proposed leper asylum at Cuttack is under the consideration of Government and is expected to materialize soon. A lump provision of Rs. 1,00,000 has been made in the current year's budget towards the cost of the scheme.

The noticeable feature of the return is that the number of female patients treated in all classes of hospitals and dispensaries in the province increased from 955,242 in 1916 to 1,101,478 in 1917, or 15.31 per cent. The percentage of females to the total number of patients treated also rose from 27.58 to 28.93, which is, I think, satisfactory. In the Patna City, the Duchess of Teck Zanaana Hospital, which is maintained by the Zanana Bible and Medical Mission and has been doing admirable work for the relief of the sick *pardanashin* women of the locality, was, during the year under review, brought on the list of the medical institutions recognized by the Medical Department, and its statistics have, for the first time, been included in the returns of the Department. The female hospitals at Chapra and Laheria-sarai, a reference to which was made in the last triennial report, were also opened in 1917. Of the total patients treated in classes I, III, and IV institutions, 5,106 were Europeans and Anglo-Indians, 2,116,675 were Hindus, 609,692 were Muhammadans, and 67,631 belonged to other classes. The figures for 1916 were 4,348, 1,910,239, 569,435, and 67,267, respectively.

Surgical operations.—The surgical operations performed in all classes of hospitals and dispensaries numbered 152,005 against 148,076 in 1916. In the institutions in classes I, III, and IV, 123,418 operations were performed on 121,970 patients in 1917 as compared with 118,325 and 117,048, respectively, in the preceding year. The results of these operations were as follows:—

YEAR.	Cured.	Relieved.	Discharged otherwise.	Died.
1917	96.81	2.71	.28	.20
1916	96.36	3.08	.36	.20

Correspondence.

HOSPITAL EQUIPMENT WANTED.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—There must be many mofussil hospitals which are in the same position as we are here. During the last four years we have not been buying hospital supplies except such as were essential, and in consequence we are very short of stock and needing badly to replace many things which have had to do during war time. There are now in some of the large military centres very extensive war hospitals, which will presumably be closed in the near future. If the equipment from these hospitals is to be sold, it would be a very real help to us in charge of up-country hospitals, if it were possible for you, through the *Gazette*, to put us in touch

with those responsible for disposing of these supplies, or at any rate give ample notice if such sales are to take place.

Yours, etc.,

CHIKBALLAPUR, } J. WINTERBOTHAM, M.B., B.C.
MYSORE STATE.

JELLYFISH POISONING.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—During my stay at Cox's Bazar, as Assistant Surgeon in medical charge of the station, I have come across cases of jellyfish poisoning which may be of some interest to the profession, if recorded in your much esteemed journal. So I beg to state below briefly some of my experiences in this connection.

The first case noticed by me was in a Bengali gentleman, an officer of the Forest Department, aged about 26. He went for a sea bath one morning when here; I also accompanied him. While he was taking his bath he suddenly felt an intense pricking sensation in his left forearm. He said he was, as it were, lashed with a fine cane studded with prickles. At that time he noticed a jellyfish passing close by him. He immediately came out of the water and found some red marks on his left forearm. On examination I found three erythematous marks across the lower part of the flexor surface of the forearm; each of them was about 2" long $\frac{1}{2}$ " thick, situated one inch apart from one another. There was another mark of the same character on the dorsum of the forearm, near the elbow. I accompanied him to his house, which was near by. He all along complained of a pain of a severe burning character at the seat of the injury. Leaving him there I came back to my house, which was about ten minutes' walk from his. Soon after I was urgently called to attend him, and it was stated that his condition had become serious. I found him in a semi-recumbent posture, with difficulty of breathing. He complained of a marked choking sensation in his throat, inability to swallow anything, even liquids. He also said that he felt as if his chest had been put into a vice. Pulse was found to be 64 per minute and feeble, muscles of the chest and abdomen were in a state of spasm, more so the two abdominal recti, which were found to be very rigid; inspirations were short, but no marked variation was noticed in the frequency of respiration. While he was suffering from these symptoms local pain was a little less than what he felt before. Brandy and milk was prescribed, but he could take it only with difficulty. Symptoms continued for two hours and gradually passed off, but general weakness as after-effect remained throughout the day.

The second case noticed was that of a school-boy, aged about 17, who also passed through the same symptoms. This boy also stated he was stung by a jellyfish while he was having his sea bath. He had three linear erythematous marks on the left chest. He was treated with bromides.

The third case was in a man of the signal station. He said that he was stung by a jellyfish, and was found to pass through the same symptoms described above, with the exception that the pulse beat was quicker than normal instead of being slower as in the two previous cases. He also was treated with bromides.

The fourth and fifth cases were of two European gentlemen. They got the symptoms after taking a sea bath one afternoon, and I was called to see them the next morning. They explained that they could not sleep the whole night owing to a sense of constriction in the chest and a severe pain in the whole body. They showed to me erythematous linear marks about the patella. Their pulse was normal at that time. The pain was still on them. They were treated with bromides.

I had an opportunity of holding an autopsy on a Mugh fisherman, aged about 29, of good musculature. He died under the following circumstances. He caught a boatful of fish in the sea, amongst which there were a number of jellyfish, and whilst throwing these off he suddenly felt a choking sensation in his throat and chest and could speak only with great difficulty, and he fell prostrate. He died on the way to hospital. On post-mortem examination, I found an unhealed, skin-deep incised wound across the ventral aspect of the index, middle and ring fingers of the right hand. There were no other external injuries. On opening the body, the scalp, meninges and the brain were found to be congested with blood; the great veins of the neck were engorged, pleura and lungs were healthy, the pericardium contained about half an ounce of clear yellow fluid, the heart was healthy but the ventricles were full of blood—the right more than the left. Other organs were healthy but congested.

These cases occurred during the months of May, June and July, 1917 and 1918, when the jellyfish were found to abound in number; at no other times were they seen.

I could find no description of jellyfish poisoning in any authoritative literature in detail. In Castellani and

Chalmers' *Manual of Tropical Medicine* it is mentioned in a few lines which I beg to quote here: "The jellyfishes of European waters such as *Rhizostoma pulini* of the Mediterranean and *R. Cuvieri* of the English Channel are well known to cause local redness, swelling, and urticarial eruptions. The jellyfishes of the tropics produce the same symptoms but with greater severity. The pain is agonizing and there is collapse, with local swelling and redness. The treatment is to give stimulants internally and to apply alkalies, such as dilute ammonia, to the affected area. Usually recovery is complete and there are no after-effects." But nothing is said about the symptoms of spasm which occurred in all my cases; there were no urticarial eruptions either.

Yours, etc.,

COX'S BAZAR, } JATINDRASANKER ROY, M.B.,
17th November, 1918. } Medical Officer, Cox's Bazar.

SOME OBSERVATIONS ON "INFLUENZA."

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—I am not attempting in this letter to give any elaborate or comprehensive history of the disease, nor do I consider it necessary to tire my readers by a repetition of its etiology, symptoms or pathological manifestations so ably and voluminously narrated in any good text-book of medicine. I shall only give, in brief, a few features of this disease that came to my notice in the recent epidemic.

The wave of pandemic influenza has been passing all over the world this year and it has not spared India in its way. Indore, like other places, could not escape from its ravages, and soon after the first wave of simple influenza passed away, in the months of August and September, when the only symptoms noticed were a mild naso-pharyngeal catarrh, slight fever and aching of the body, we had a serious outbreak in the first week of October last, when a large number of cases were seen drifting into a terrible kind of septic pneumonia. Immediately on the notice of a few such cases, a conference of all the medical men of the city was called up by the State Surgeon, Indore, to consider prompt measures to withstand and abate the disease. About a dozen and a half doctors volunteered to work in connection with the epidemic, and with the generous monetary help of the State more than a dozen medical depôts were opened in the city for free distribution of medicine. Some of us volunteered to visit patients in their houses and treat them, and we were aided in this arduous task by a corps of nearly 800 students volunteers, who went from door to door and carried medical relief. Besides these out-patients' dispensaries, the Maharaja Shivajirao High School, the Juna Indore School, and the State Theatre were temporarily converted into hospital wards to keep in-patients, the last being in charge of my friend Dr. V. R. Bhagwat.

I had the privilege of being placed in charge of two wards specially reserved for influenza patients in the Maharaja Tokoji Rao Hospital, where 45 beds were thus reserved for my patients. Besides nearly 1,000 out-patients, I treated during one month 218 in-patient cases, from 14th October to November 12th, 1918, out of which 100 were pneumonic, showing about 50 per cent. of the total number treated. It was observed that there was a large percentage of cures among cases treated in the hospital, showing a figure of 62 per cent. of such recovery, and any reports or rumours of 5 per cent. or 10 per cent. cures in pneumonic influenza are simply unfounded. It is again of special interest to note that the mortality was invariably from amongst the pneumonic cases, and the simple non-pneumonic cases, if seen sufficiently early, always recover. In many of my cases there was double pneumonia also, and of the small percentage of fatal cases nearly 60 per cent. were admitted one week or more after the commencement of illness, when the disease had developed serious complications. Though a terrible disease, I have learnt from my personal experience that it can be successfully abated and cured if taken in hand early and proper nursing is available to the patients.

The treatment that has proved most efficacious in my cases has been as follows:—

Early in the case, before pneumonic complication takes place, I prescribe a mixture of citrate of potash and acetate of potash.

In all the cases I have seen that with the above mixture the disease is at once aborted and the temperature comes to normal. In cases where there is pneumonia (which is always broncho-pneumonia), I prescribe the following:—

Ammon. Carb.	...	...	grs. 20.
Ammon. Chloride	...	...	dr. 1.
Pot. Acetas	...	...	dr. 1.
Pot. Citras	...	...	dr. 1.
Tincture Cinchona Co.	...	...	drs. 2.
Spirit Ammonia Aromatic	...	...	drs. 2.
Spirit Vini Gallici	...	...	drs. 4.
Aqua	...	...	ozs. 4.

A quarter every third hour. (If the patient is serious continue mixture even during night.)

Râi pastes or plasters on the affected areas. (In cases where money can be spent liberally, the costly treatment of Antiphlogistin paste has also been found useful.)

With the above mixture the pneumonic condition resolves quickly and the patient gets over the disease almost always, except when he is extremely serious, and taken late in hand, has both the lungs fully affected, and the pulse tone quite soft.

In a large number of cases, an intractable cough is left behind, and for this I have found sodii. benzoas and large doses of ammon. chloride and ammon. carb. very useful. If the pulse is good and even both the lungs are affected, the case is hopeful. Pulse tone is a very valuable guide in the prognosis.

Then besides this, I have inferred certain facts of particular interest about this disease which can be summarized as under:—

1. Influenza is almost always amenable to treatment if observed sufficiently early, and the mortality is always from amongst pneumonic cases.

2. Double septic pneumonia is a more serious condition than single pneumonia, and in single pneumonia the left lung is more often involved than the right.

3. Broncho-pneumonia as a complication of influenza has these features of its own:—(i) Dulness is rarely present. (ii) Pain in the chest is almost always absent. (iii) Hæmoptysis is not so common as in ordinary lobar pneumonia. (iv) Epistaxis is more common. (v) One patch after another is successively affected, pneumonia resolving in one place and coming on in another; thus (vi) Exhibiting frequent relapses, sometimes one, sometimes two, and even three. Relapse is more serious than the first attack.

4. The tone of the pulse is a very valuable guide, and cases of double pneumonia even are cured if the tone of the pulse remains good.

5. Râi plasters, pastes and fomentations play a great part in bringing about a cure.

Then I have noticed the following complications and after-results, which are also interesting:—

1. Broncho-pneumonia,—very frequent complication and seen in a large number of cases.

2. Urticarial eruptions seen by me in one case, but reported by my friend in others also.

3. Joint pains (but rarely), sometimes giving rise to local abscesses.

4. Two cases of impaired vision were noticed by me, in which there were distinct signs of retinitis, one reported by my friend Dr. V. R. Bhagwat.

5. One case of cancerum oris was observed.

6. Extreme cardiac asthenia is a frequent after-result, and the patient takes a long time for convalescence, rendering him unfit for ordinary work for a month or more after the illness.

7. Deafness has been noticed in four cases, but it is to be seen whether this remains permanent or disappears in course of time.

8. Insanity was observed in two of my cases, and in one reported by my friend Dr. V. R. Bhagwat.

9. Intense abdominal colic sometimes is a symptom of an attack of influenza.

Thus it will be seen how curious are some of its complications, and the disease being one of general poisoning of the whole system, it may be discovered by the experience of other members of the profession what other organs are likely to be affected in this malady. By a joint experience it is likely that we may learn more about the nature of this calamity than is hitherto known, and remedy being subsequent to knowledge of its nature, we might by better knowledge begin to find out a more effective method of cure and prevention.

INDORE,
21st November, 1918.

S. S. VYAS, M.A., LL.B.,
Sub-Assistant Surgeon,
Maharaja Tokoji Rao Hospital.

"AN UNCLASSIFIED FORM OF LONG CONTINUED PYREXIA IN MESOPOTAMIA. (? DISSEMINATED NOCARDIOSIS.)"

To the Editor of the INDIAN MEDICAL GAZETTE.

SIR,—In reference to the paper which appeared in the *Indian Medical Gazette* for September 1918 under this heading, pp. 321, et seq., further investigations do not bear out the suggestions I made that the disease might be due to disseminated nocardiosis, at any rate in the British cases, which were the most striking and with which my investigations were solely concerned. Further examination of the original sections suggests that the fungus-like tuft may be the result of outside contamination, especially as no more can be found in fresh pieces of the organs.

One of the most typical cases turned out at the autopsy to be kala-azar in spite of two negative visceral punctures

during life, whilst an invasion of the lung by a fungus of the aspergillus type was proved after death.

This was the case from whose blood a streptothrix-like fungus was believed to have been isolated.

There are undoubtedly some cases where streptothrix fungi have been found in the pus from local abscesses, but the presence of air-borne fungi, which are at present indistinguishable from the pathogenic variety has been shown to exist, so that the very large number of cultural results that have been obtained must be considered *sub judice*.

As regards the type of long continued fever described by Lt.-Col. Sprawson, I.M.S., if it is a separate clinical entity, its pathogeny remains undetermined, as far as my observations are concerned.

Lt.-Col. Ledingham, R.A.M.C., is also of this opinion.

F. B. MACKIE,

Major, I.M.S.

MAJOR Mackie has asked me to forward the above note. Some of the Indian cases described by me in that paper, including cases Nos. 7 and 9, where the possibility of tubercle was mentioned, have proved post mortem to be tuberculous. Regarding the British cases, the result of Major Mackie's further observations is to leave their pathogeny obscure; their subsequent history and pathological examinations have as yet (so far as I have heard) added nothing that throws light on their nature. In another case the streptothrix has been found present in multiple abscesses in several organs; but such cases have been described before. The case referred to by Major Mackie as having proved post mortem to be kala-azar was not one of the series described by me.

Yours, etc.,

C. A. SPRAWSON,

Lt.-Colonel, I. M. S.

12th November, 1918.

THERAPEUTIC NOTICE.

A CORRECTION.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—In the August issue of the *Indian Medical Gazette*, under "Therapeutic Notices," on page 314, we came across the following:—

"Messrs. Martin and Harris, of Calcutta, are advertising the well-known preparations of the firm Emil Scheller, of Zurich, a Swiss firm founded in 1877. Their ESCA SYRUP is a tonic syrup made up of Potassium Sulphoguaiaaculate (or *Thiocol*), and the Hypophosphites of lime, soda and manganese, combined with pine tar, Virginian prime and other demulcents. It is specially recommended for catarrhs and colds."

Perhaps you are not aware that the word *Thiocol* was registered by us some years ago in India, and elsewhere, and consequently any firm using our registered trademark "*Thiocol*" in connection with the advertising of their products is infringing our rights, and in view of the trouble we have experienced in the past in the matter of the substitution of *Thiocol* '*Roche*' we intend to take stringent measures in all future cases. We do not for one moment suggest that you were cognisant of the circumstances, and fully realize that you acted in ignorance. We are therefore merely writing you in order that you may be quite clear as to the position in the future, and also that should further matter in the way of advertisements, etc., of competitive lines for insertion in your esteemed journal have reference to our registered mark "*Thiocol*" you will be able to draw the advertisers' attention to the fact that they lay themselves open to prosecution by mentioning our registered trade mark "*Thiocol*" in their advertisements, etc.

For your guidance we will state that our Agents in India, Messrs. J. Murray & Co., Ltd., of Bombay, Calcutta, etc., are in communication with Messrs. Martin and Harris, and we trust the matter will be settled amicably.

Yours faithfully,

THE HOFFMANN-LA ROCHE CHEMICAL WORKS, LTD.

[We are glad to publish the above correction.—ED., I.M.G.]

Service Notes.

THE number of casualties among officers reported during the fourteen days, 25th September to 8th October inclusive, was high—3,180—but a good deal lower than that of the preceding fortnight. They may be tabulated as follows:—

Killed	...	...	...	848
Died ...	...	...	...	46
Wounded	...	...	...	1,980
Missing	...	...	...	234
Prisoner	...	...	...	72
TOTAL				3,180

The number of casualties among medical officers, 52, was also high. The large proportion of killed to wounded is noticeable, as also the very high proportion of senior officers in the list, a far higher proportion than usual. The names are given below. All not otherwise noted are temporary officers of the R.A.M.C. Temporary Lieutenant-Colonel K. W. Mackenzie, D.S.O., M.C., R.A.M.C., was formerly a Captain in the I.M.S., but resigned his commission before the war.

Killed and died of wounds.—Lieutenant-Colonels R. T. Collins, D.S.O. (R.A.M.C., Regular), and F. H. Bradley, D.S.O. (R.A.M.C., Regular); Majors J. Hughston, H. B. Gorman, M.C., T. F. P. Breen (R.A.M.C., Regular), and C. McN. McCormack, (R.A.M.C., Regular); Captains J. T. Kirkland, M.C., C. H. Fischel (S.R.), L. E. W. Roberts (Australians), and C. R. Howard, K. McA. Ross; Lieutenant M. J. O'Flynn, Surgeons A. R. MacMullin, D.S.C. (R.N.), and F. P. Pocock; D.S.O., M.C. (R.N. Temporary); and Surgeon Probationer N. C. Ward (R.N.V.R.).

Died.—Major A. Johnston; Captains J. F. Graham (Canadians), and J. Wood (L.D.S., R.A.M.C.); Lieutenants L. S. Ramier (I.M.S.), and D. Taylor; Staff Nurse M. Townsend (Q.A.I.M.N.S.R.); and Mrs. W. Bailey (V.A.D.).

Wounded.—Lieutenant-Colonels K. W. Mackenzie, D.S.O., M.C., and A. S. Donaldson, D.S.O. (Canadians); Majors W. Russell, M.C. (T.F.), E. S. Sowerby, M.C., A. R. Dale, M.C. (S.R.), C. B. Davies, M.C., and W. Vickers (Australians); Captains G. R. Phillips, J. McCusker (Australians), K. McLean (Australians), J. H. Campaign, W. K. Flock (Australians), R. H. Fleming, H. K. Ward, M.C. (S.R.), E. C. Bowden, N. F. Graham, D. R. Wark (Canadians), W. H. Johnston, G. A. C. Gordon, D. Barlow, M.C. (Australians), C. E. Driscoll, R. Goulden (Canadians), J. H. Barry (Canadians), and H. M. Cameron (Canadians); Lieutenants G. E. Birkett (S.R.), H. A. Chodak, and F. Cameron (S.R.); Staff Surgeon G. R. Atkinson, D.S.O. (R.N.); and Surgeon J. E. L. Roberts (R.N.).

Missing.—Captains J. Buchanan and W. C. D. Witson (T.F.).

Prisoner.—Major and Quarter-Master E. J. Tilbury (R.A.M.C., Regular).

Major Alexander Johnston, R.A.M.C., died at a nursing home in Glasgow on 22nd September, 1918. He was educated at Glasgow University, where he graduated as M.B. and C.M. in 1883, and as M.D. in 1889, also taking the D.P.H. Cambridge in 1893. After filling the posts of Resident Medical Officer of the Victoria Hospital, Burnley, House Surgeon of Wrexham Infirmary, and Medical Superintendent of Mousall Hospital, Manchester, he settled in Glasgow, where he was Deputy Medical Officer of Health, and Senior Physician Superintendent of the City of Glasgow Hospitals. He held a temporary commission as Major in the R.A.M.C. from April 1915, and was recently in command of the Thornhill Military Hospital, Aldershot.

Lieutenant-Colonel Reginald Thomas Collins, D.S.O., R.A.M.C., was killed in action on 18th September, 1918; aged 38. He was born on 22nd December, 1879, the only son of Dr. Wolfenden Collins, late of Sydenham, and was educated at Guy's Hospital, taking the M.R.O.S. and L.R.C.P. London in 1902. He entered the R.A.M.C. as Lieutenant on 31st August, 1903, became Captain on 28th February, 1907, Major on 28th February, 1915, and temporary Lieutenant-Colonel on 11th September, 1916. He received the D.S.O. on 1st January 1918, and also had the Croix de Guerre.

Captain James Towers Kirkland, M.C., R.A.M.C., was killed in action on 18th September 1918. He was the youngest son of Archibald Kirkland, of Newmains, and was educated at Glasgow University, where he graduated as M.B. and Ch.B. in 1909, subsequently filling the posts of House Surgeon and Casualty House Surgeon at Glasgow Royal Infirmary, and of House Surgeon to the Glasgow Maternity and Women's Hospital. He took a temporary commission as Lieutenant in the R.A.M.C. on 2nd December, 1914, was promoted to Captain on completion of a year's service, and received the Military Cross on 14th January, 1916. He was attached to the Gloucestershire regiment when killed.

Captain L. E. W. Roberts, Australian Army Medical Corps, was reported as having died of wounds, in the casualty list published on 27th September, 1918.

Captain Charles Reginald Howard, R.A.M.C., attached King's African Rifles, was killed in action in East Africa on 6th September, 1918. He was the youngest son of Robert Luke Howard, of Tynemouth, formerly of St. Albans, and was educated at Guy's Hospital and at Cambridge, where he graduated as B.A. (with honours), M.B. and B.C. in 1904,

and M.D. in 1907, also taking the M.R.C.S. and L.R.C.P. London in 1902. After acting as Assistant House Surgeon and House Surgeon at Guy's, he went to Zanzibar as Bacteriologist to that Government. Returning to England, he settled in practice at Garston, Frome, Somerset, where he was Honorary Surgeon to the Victoria Hospital, Frome, Medical Officer of Health to the Frome Rural District Council, and Assistant School Medical Officer to the Somerset County Education Committee. He took a temporary commission as Lieutenant in the R.A.M.C. on 1st March, 1916, and was promoted to Captain on completion of a year's service.

Captain Claude Henry Fischel, R.A.M.C. (S.R.), attached Leicestershire Regiment, died of wounds on 14th September, 1918, aged 28. He was the only son of the late H. J. Fischel, of Hampstead. He took the L.M.S.S.A. in 1914, joined the Special Reserve of the R.A.M.C. on 28th November, 1914, and was called out for service on 28th May, 1915.

Captain James Wood, L.D.S., attached R.A.M.C., died at Salonika on 14th September, 1918. He was the third son of Andrew Wood, of Tantallon Place, Edinburgh, was educated at George Watson's College in that City, and took the L.D.S. of the Edinburgh College of Surgeons in 1914. He was a member of the Lothian and Border House, was embodied in August 1914, and went to the front in August 1915. He subsequently received a commission for service as a Dental Surgeon.

Captain James Steel, M.C., R.A.M.C. (S.R.), was killed in action on 2nd September, 1918, aged 25. He was the only son of Mr. D. F. Steel, of Dennistoun, Glasgow, and was educated at Glasgow University, where he graduated as M.B. and Ch.B. in 1916, having acted as Resident Assistant at Glasgow Eastern District Hospital during his final year. On qualifying he took a commission as Lieutenant in the Special Reserve of the R.A.M.C., and soon after went to France, where he served successively with the Royal Sussex Regiment and with the Somerset Light Infantry, with which he was serving when killed. He received the Military Cross for services with the Sussex during the retreat of March 1918, when he was with his battalion throughout the retirement, the award being gazetted, after his death, on 16th September.

Major Hugh Bernard German, M.C., R.A.M.C., was killed in action on 18th September, 1918, aged 38. He was the eldest son of the late Alexander German, and of Mrs. German, of Southsea, was educated at Guy's Hospital, and took the M.R.C.S. and L.R.C.P. London in 1904. He then entered the Royal Navy as Surgeon, and while in the Navy received a medal for his services in connection with the Calahian earthquake of 1908, and also the order of the Crown of Italy. He resigned while still holding the rank of Surgeon, and went into practice at Waltham Abbey, Essex. He held a temporary commission as Captain in the R.A.M.C., dated 8th January, 1916, and had since been promoted to Acting Major. He received the Military Cross on 4th February, 1918, and a Bar thereto on 16th September.

Captain Kenneth McAlpin Ross, R.A.M.C., was killed in action on 17th September, 1918, aged 26. He was the second son of the late Dr. Ross, of Paisley Road, Glasgow, and was educated at Glasgow University, where he graduated as M.B. and Ch.B. in 1915. Immediately afterwards he took a temporary commission as Lieutenant in the R.A.M.C. and was promoted to Captain on completion of a year's service.

Lieutenant-Colonel Frederick Hoysted Bradley, D.S.O., R.A.M.C., was killed in action on 22nd September, 1918, aged 34. He was born on 22nd November, 1883, the youngest son of the late Canon Bradley, of Monaghan, and was educated at Campbell College, Belfast, and at Edinburgh University, where he graduated as M.B. and Ch.B. in 1906. He entered the R.A.M.C. as Lieutenant on 4th February, 1908, was promoted to Captain on 4th August, 1911, and during the war was serving in India, came to France in September 1914, and had served there ever since. He received the D.S.O. on 1st January, 1918.

Major Campbell McNeill McCormack, M.C., R.A.M.C., was killed in action on 21st September, 1918. He was the youngest son of William McCormack, of Hillhall House, Lisburn, and was educated at Lisburn School and at Belfast University, where he graduated as M.B., B.Ch. and B.A.O. in 1914. He took a commission as Lieutenant in the Special Reserve of the R.A.M.C. on 5th February, 1914, and joined for duty on 6th August, 1914. Early in 1917 he took a commission in the Regular R.A.M.C., and a year later became Captain. In January 1916, he was mentioned in despatches, and on 22nd September, 1916, he received the Military Cross. He was recently wounded.

Major J. Hughston, R.A.M.C., was reported as having died of wounds, in the casualty list published on 28th September, 1918. He took a temporary commission in the R.A.M.C. as Lieutenant on 20th April, 1915, was promoted to Captain on completion of a year's service, and subsequently to a

Major Thomas Francis Penefather Breen, R.A.M.C., was killed in action on 18th September, 1918, aged 29. He was the elder son of the late Inspector-General Breen, R.N., and was educated at Stonyhurst and at Trinity College, Dublin, where he graduated as M.B., B.Ch. and B.A.O. in 1912. After acting as Senior House Surgeon of the Mater Misericordiae Hospital, Dublin, he entered the R.A.M.C. as Lieutenant on 30th January, 1914, was promoted to Captain on 30th March, 1916, and had since received an Acting Majority. He went to France with the First Expeditionary Force in August 1914, was with No. 11 Field Ambulance in the retreat from Mons, and had served in France ever since, part of the time in command of a Field Ambulance, and twice acting as D.A.D.M.S.

Surgeon Frank Pearce Pocock, D.S.O., M.C., R.N., died of wounds on 29th September, 1918, aged 27. He was the younger son of Charles Wellesley Pocock, of Portsmouth, formerly of Ealing, and was educated at King's College, London, and at Westminster Hospital, taking the M.R.C.S. and L.R.C.P. London in 1913. He took a temporary commission as Surgeon in the Navy at the beginning of the war, and for some time served on H.M.S. *Colossus*. He received the D.S.O. on 23rd July, 1918, and had previously gained the Military Cross.

LIEUTENANT LAKSHMINARAYANAPURAM SUBRAMANIER RAMIER, I.M.S., died in the 3rd London General Hospital, Wandsworth, September 1918, aged 25, of tubercle contracted on duty in France. He was a Southern India Brahman, and was educated at Madras University, where he graduated in 1916, as M.B. and B.S., gaining gold medals in Clinical Surgery and Medicine, and also for being the most distinguished medical graduate of the year. He was also Captain of the Cricket Eleven, and a member of the Football Eleven of Madras Medical College. Coming to England, he took the M.R.C.S. and L.R.C.P. London in 1916, and received a permanent commission in the I.M.S. on 23rd January, 1917. He served for some time on a hospital ship, and then in charge of the tubercle wards in an Indian General Hospital at Marseilles, and was invalided to England in June 1918.

LIEUTENANT MICHAEL JOSEPH O'FLYNN, R.A.M.C., attached Northampton Regiment, died of wounds on 24th September, 1918, aged 39. He was educated at the Catholic College, Dublin, and at Queen's College, Galway, and graduated as M.B., B.Ch. and B.A.O. of the Royal University, Ireland, in 1903, and as M.D. in 1907. After acting as House Surgeon of the Wolverhampton and Midland Counties Eye Infirmary, and as House Physician of the Salisbury Hospital, he went into practice at Neath, Glamorgan. He took a temporary commission as Lieutenant in the R.A.M.C. in November 1917.

Captain James Cotton Forsyth, Canadian Army Medical Corps, died of wounds at sea in his passage home to Canada, on 8th September, 1918. He was born at Mount Bridges on 3rd March, 1871, and educated at the Western University, London, Ontario, where he graduated in 1894. He joined the Canadian A.M.C. in April 1916, served in England till July 1917, when he went to France, and was attached to No. 1 Canadian General Hospital, with which he served till invalided in June 1918.

Captain Thomas Fleck Graham, Canadian Army Medical Corps, died suddenly of cardiac failure on 20th September, 1918, aged 35. He was born on 20th August, 1883, at Guelph, Ontario, the son of Alexander Graham of Brantford, Ontario, and educated at Toronto University, where he graduated in 1914. He joined the Canadian A.M.C. in July 1916, and after serving in England for some months, went to a hospital in France.

Lieutenant Douglas Taylor, R.A.M.C., died of dysentery and malaria in hospital at Salonika on 26th July, 1918, aged 23. He was the only son of the late Dr. John Taylor, of Whiteinch, Glasgow, and was educated at Glasgow High School and Glasgow University, where he graduated as M.B. and Ch.B. in 1917. During his final year he acted as Clinical Assistant at Govan District Asylum, Hawkhead. He had only recently taken a temporary commission in the R.A.M.C.

THE number of casualties among officers reported during the fourteen days, 9th to 22nd October, 1918, inclusive, reached the very high total of 4,526, almost equalling the figures of last March. On one day, 14th October, no less than 562 were reported. They may be tabulated as follows:—

Killed ...	...	...	1,210
Died ...	...	...	47
Wounded ...	...	...	2,893
Missing ...	...	...	281
Prisoners ...	...	...	95

TOTAL ... 4,526

The number of casualties among medical officers was also high, 68, including four nurses. The names are given below. All, not otherwise noted, are temporary officers of the R.A.M.C.

Killed and died of wounds.—Captains G. M. Cowper, R. P. Young (Australians), K. Elmes, J. A. Stanley, A. Ross (Canadians), J. M. McLaggan, M.C., G. A. G. Barser, (T.F.), W. B. Jack, H. A. Culham (Canadians), H. E. Kirkland, M.C. (Australians), W. S. B. Hay, C. L. Dold, J. James (Regular, R. A. M. C.), E. L. Jones, A. A. Parker, M.C. (Canadians); Lieutenants W. L. Dandridge (S.R.), D. G. K. Garrett.

Lost at sea.—Lieutenant-Colonel E. F. H. Dobson (I.M.S., Retired); Captain D. Burns; Surgeon-Lieutenant B. Lewitt (R.N.); Dr. T. R. Beale-Browne (W.A.M.S.); Misses S. V. Barrett (V.A.D.), and D. M. Jones (V.A.D.).

Died.—Colonel G. H. Van Zyl (South African); Majors T. P. Priestley (Regular, R.A.M.C.), G. H. McNichol; Captains B. H. Leigh, G. Finch (T.F.), G. S. Brock (I.M.S.), L. C. Crockett (L.D.S., attached R.A.M.C.); Lieutenant E. H. Glenny (S.R.); Dr. C. F. W. Watson (W.A.M.S.); Sister G. E. Munro (Australians); Miss L. Liddell, V.A.D.

Wounded.—Lieutenant-Colonels H. L. Welch (Australians), W. W. Boyce (Regular, R.A.M.C.), M. R. Taylor, D.S.O. (S.R.); Majors T. J. Kelly, M.C. (S.R.), T. Ferguson, W. Hunt, M.C. (S.R.), T. J. Lindsay (S.R.), J. Vallance (S.R.), H. C. Adams (T.F.); Captains R. J. Snider, W. K. Acheson, M.C., W. C. Morgan (Canadians), G. B. Egerton (S.R.), H. S. Berry, A. McA. Blackley (Canadians), J. C. Dunn, D.S.O., M.C., D.C.M., B. M. Tuke, M.C. (S.R.), H. E. B. White (S.R.), H. G. Young, D.S.O. (Canadians), F. E. Bedale, M.C. (T.F.), H. M. Joseph, F. B. Day (Canadians), A. H. McLean (Australians), R. F. Matters (Australians), A. Wilson, I. D. Stubbs (T.F.), W. A. Coats, W. E. R. Dimond, S. Hodgson, M.C.; Captain and Quartermaster E. S. H. Caple (T.F.); Lieutenants G. P. W. Stamston, M. C. Paterson, W. Hickey, H. E. D. Mathur (I.M.S., Temporary).

Captain Geoffrey Moore Cowper, R.A.M.C., died of wounds, on 3rd October, 1918. He was the son of Mr. Cowper, of Darlington, was educated at Cambridge and St. Bartholomew's Hospital, and took the M.R.C.S. and L.R.C.P. London in 1914. He took a temporary commission as Lieutenant in the R.A.M.C. on 29th August, 1914, in the first month of the war, was promoted to Captain after a year's service, and was recently serving in the 35th Field Ambulance, but was attached to the Dorsetshire Regiment when killed.

Lieutenant William Leslie Dandridge, R.A.M.C., died of wounds on 3rd October, 1918, aged 24. He was the youngest son of Alfred Dandridge, of Beckenham, Kent, and had only recently qualified, and joined the Special Reserve of the R.A.M.C. in February, 1918. He was serving in the 103rd Field Ambulance.

Captain John Williamson Frew, R.A.M.C., died of wounds in No. 8 General Hospital on 8th October, 1918. He was the second son of the late William Frew, of Leamington Terrace, Edinburgh, and was educated at Edinburgh University, where he graduated as M.B. and Ch.B. in 1906, afterwards going to South Africa, where he was in practice at Moher's Ford, Barkly East, Cape Province. He took a temporary commission as Lieutenant in the R.A.M.C. on 11th October, 1915, and was promoted to Captain after a year's service.

Major Percival Thomas Priestley, R.A.M.C., died of influenza at Salonika on 28th September 1918, aged 30. He was born on 1st February, 1888, the only son of the late Reverend Thomas Priestley, Vicar of Allbrighton, and was educated at Birmingham University, where he graduated as M.B. and Ch.B. in 1913, after taking the M.R.C.S. and L.R.C.P. London in 1912. After filling the posts of House Surgeon and House Physician at the General Hospital, Birmingham, he entered the R.A.M.C. from the Special Reserve, as Lieutenant on 31st July, 1914, was promoted to Captain on 30th March, 1915, and was subsequently to an Acting Majority.

Captain R. P. Young, Australian Army Medical Corps, was reported as killed in action, in the casualty list published on 10th October, 1918.

Captain A. Ross, Canadian Army Medical Corps, was reported as killed in action, in the casualty list published on 14th October, 1918, and Captain H. A. Culham, of the same corps, in that of 16th October, 1918.

Captain Benjamin Hinton Leigh, R.A.M.C., died at Manor War Hospital, Epsom, on 9th October, 1918, of illness contracted on foreign service, aged 51. He was educated at the Universities of Manchester and Edinburgh, and took the Scottish triple qualification in 1896. He then went to South America, and was for some years in practice in Peru, but had retired before the war. He took a temporary commission as Lieutenant in the R.A.M.C. on 1st April, 1915, and was promoted to Captain on completion of a year's service.

Dr. Thomas Richard Beale-Browne, of the West African Medical Staff, was lost at sea in the S.S. *Burutu*, sunk in a collision on 3rd October, 1918. He was the eldest son of

Lieutenant-Colonel G. E. Beale-Browne, of Dowdeswell House, Gloucestershire, and was educated at Guy's Hospital, taking the M.R.C.S. and L.R.C.P. London in 1901. After acting as Assistant Medical Officer of Northampton County Asylum, he joined the W.A.M.S.: He had served on the Anglo-German Boundary Commission, which demarcated the frontier from Yola to Cras River, between the British and the (then) German colonies in West Africa.

Miss Sophia Violet Barrett, V.A.D., was lost in the R.M.S. *Leinster*, torpedoed and sunk by a German submarine, soon after leaving Dublin for Holyhead, on 10th October 1918. She was the younger daughter of the late Samuel Barrett, J.P., of Ballintra, County Galway, and was returning from leave to duty in France. Miss Dorothy May Jones, V.A.D., was also lost in the *Leinster*.

Captain King Elmes, R.A.M.C., was reported as killed in action, in the casualty list published on 14th October, 1918. He took the L.R.C.P. and S.I. in 1916 and at once took a temporary commission in the R.A.M.C., being promoted to Captain after a year's service. He resided at New Ross, and was attached to the London Regiment when killed.

Captain J. A. Stanley, R.A.M.C., was reported as killed in action, in the casualty list published on 14th October, 1918. He originally joined the Canadian Army Medical Corps as Lieutenant, was transferred to the R.A.M.C. as a temporary Lieutenant in the middle of 1916, and promoted to Captain after a year's service. He was attached to the Warwickshire regiment when killed.

SURGEON-GENERAL SIR ALEXANDER CHRISTISON, Bart., Bengal Medical Service, retired, died at his residence, 40, Moray Place, Edinburgh, on 14th October 1918, aged 90. He was born on 26th August, 1828, the eldest son of the late Sir Robert Christison, Professor of Medical Jurisprudence and afterwards of Materia Medica, at Edinburgh University, and was educated at Edinburgh Academy and at the University in that City, where he graduated as M.D. in 1850, gaining a gold medal for his thesis on *Cannabis Indica*. Entering the I.M.S. as Assistant Surgeon on 20th October, 1851, he became Surgeon on 24th March, 1864, Surgeon-Major on 20th October, 1871, and Deputy Surgeon-General on 31st March, 1877, and shortly after was appointed Surgeon-General (local rank) as Chief Civil Medical Officer of the North-West, now the United Provinces. He retired on 24th November, 1882, with the honorary rank of Surgeon-General. He served with the 4th Sikh Infantry in the second Burmese War of 1852, took part in the capture of Rangoon in April 1852, and received the medal, with a clasp. In the Mutiny he served with Meade's Horse, and afterwards with the 13th Bengal Infantry, was present at the capture of Gwalior, and gained the medal, with a clasp. After the Mutiny he was appointed Superintendent of Vaccination at Agra, and Lecturer on Surgery in the Agra Medical School, subsequently becoming Principal of the School, Superintendent of the Agra Lunatic Asylum, and Civil Surgeon of Agra, and held these appointments until his promotion to administrative rank. On 23rd January, 1882, shortly before his retirement, he succeeded his father as Second Baronet (created 1871). He had twice been married, his younger son, Lieutenant F. G. Christison, Argyle and Sutherland Highlanders, was killed in action in December, 1915. Since the death of Surgeon-General Beatty, in November 1916, he had been the senior officer on the retired list of the I.M.S. The senior now is Deputy Surgeon-General C. T. Paske, who is less than one year junior in service to, and two years younger than, himself.

CAPTAIN JAMES MURRAY McLAGGAN, M.C., R.A.M.C., was killed in action on 4th October, 1918, aged 27. He was the elder son of James McLaggan, of Bank House, Torphins, Aberdeenshire, and was educated at Aberdeen University, where he graduated as M.B. and Ch.B. in 1913. He joined the R.A.M.C. as a temporary Lieutenant, on 22nd August, 1914, in the first month of the war, was promoted to Captain on completion of a year's service, and was attached to the Royal Fusiliers, the City of London Regiment, when killed. He gained the Military Cross on 4th November, 1915.

Captain William Boyd Jack, R.A.M.C., died of wounds on 11th October, 1918, aged 38. He was educated at Glasgow University, where he graduated as M.B. and Ch.B. in 1905 and as M.D. in 1908, and, after acting as House Surgeon and House Physician of Glasgow Royal Infirmary, went into practice at Kendal, where he was Honorary Surgeon to the Westmoreland County Hospital, Police Surgeon, and Medical Officer, and Public Vaccinator of the Grayrigg district of Kendal Union. He took a temporary commission in the R.A.M.C. early in 1917, and was promoted to Captain after a year's service.

Captain Geoffrey Alwyn Gershom Bouser, R.A.M.C. (T.F.), was killed in action on 29th September, 1918, aged 29. He was educated at Brighton College, King's School, Worcester and Cambridge, where he graduated as B.A. in 1910, and at St. Thomas' Hospital, and took the M.R.C.S. and L.R.C.P. London in 1914. After acting as Clinical Assistant in the Children's Surgical Department and as Casualty Officer at

St. Thomas', he took a commission as Lieutenant in the R.A.M.C. (T.F.), in 1915, and was promoted to Captain after a year's service. He was attached to the Norfolk Regiment when killed, and had served in Egypt, Palestine and France.

Captain George Finch, R.A.M.C. (T.F.), died of pleuropneumonia in the Officers' Hospital at Basra on 8th October, 1918. He was educated at Leeds University and at St. Thomas' Hospital, and took the M.R.C.S. and L.R.C.P. London in 1905, and also the D.P.H. Oxon in 1910. After filling the posts of Assistant House Surgeon at the Royal Westminster Ophthalmic Hospital, of House Physician at the Brumpton Consumption Hospital, and of Assistant School Medical Officer to the East Sussex County Council, he took the appointment of Assistant to the County Medical Officer of Health for East Suffolk. On the outbreak of war he joined the 3rd East Anglian (Howitzer) Brigade of Royal Field Artillery (T.F.), as Lieutenant and Medical Officer, on 11th August, 1914, and became Captain in the 3rd London General Hospital on 1st April, 1915.

Lieutenant D. G. K. Garratt, R.A.M.C., was reported as killed in action, in the casualty list published on 17th October, 1918. He only qualified in the beginning of 1918, and immediately afterwards took a temporary commission as Lieutenant in the R.A.M.C.

Captain Ernest Howard Glenny, R.A.M.C., died of pneumonia on active service on 9th October, 1918. He was educated at St. Bartholomew's Hospital, took the M.R.C.S. and L.R.C.P. London in 1917, and soon after joined the Special Reserve of the R.A.M.C. as Lieutenant, being promoted to Captain after a year's service.

Captain Hugh Edward Kirkland, M.C., Australian Army Medical Corps, was killed in action on 3rd October, 1918. He was the younger and only surviving son of the late Dr. Hugh Kirkland, of Darvel, Lithgow, New South Wales. He received the Military Cross on 18th January, 1918.

Surgeon Benjamin Lewitt, R.N., temporary, was lost in *H. M. S. Otcanto* which was sunk in a collision off the North Coast of Ireland, on 6th October, 1918. He was educated at St. Mary's Hospital, where he gained an Entrance Scholarship in Science, took the L.S.A. in 1900, and the L.M.S.S.A. in 1907, and was in practice at Clacton-on-Sea before the war.

Captain William Stevenson Brown Hay, R.A.M.C., was killed in action on 6th October, 1918. He was the son of the late Mr. George C. Hay, of Belfast, and was educated at the Methodist College in Belfast, and at Belfast University, where he graduated as M.B., B.Ch. and B.A.O. in 1914, subsequently acting as Demonstrator in Anatomy, till he took a temporary commission as Lieutenant in the R.A.M.C. on 25th May, 1915. He went to France in October 1915, was promoted to Captain on completion of a year's service, and was attached to the Royal Field Artillery when killed.

Captain Cedric Lewis Dold, R.A.M.C., was reported as killed in action, in the casualty list published on 22nd October, 1918. He was educated at Edinburgh University, where he graduated as M.B. and Ch.B. in 1914, and at once took a temporary commission as Lieutenant in the R.A.M.C. on 12th August, 1914, a week after war was declared. He was promoted to Captain after a year's service, and was attached to the South Wales Borderers (24th Fort), when killed.

LIEUTENANT-COLONEL EDWIN FRANCIS HORATIO DOBSON, Bengal Medical Service, retired, was lost on the Japanese S. S. *Hirano Maru*, which was torpedoed and sunk by a German submarine, with great loss of life, off the North Coast of Ireland, on the way to the Cape, on 5th October, 1918. He was educated at the Middlesex Hospital, and at the Universities of Edinburgh and Aberdeen, and graduated at the latter as M.B. and Ch.B. in 1878. Entering the I.M.S. as Surgeon on 2nd October, 1880, he became Surgeon-Major on 2nd October, 1892, Lieutenant-Colonel on 2nd October, 1900, was placed on the selected list on 21st November, 1905, and retired on 27th November 1910. The *Army Lists* ascribe him no war service. After some years of military duty, he was appointed Civil Surgeon of Dhubri, Assam and while acting as Inspector of Immigrants, labourers on their way to the Assam tea gardens, was the first Medical Officer to draw attention to the fact that the anaemia so prevalent among tea garden coolies was in great part due to intestinal parasites. He was subsequently appointed Protector of Emigrants in Calcutta, and later, reverting to Military duty, spent his last years of service as Medical Store-keeper in Calcutta.

CAPTAIN GEORGE SELBY BROCK, Indian Medical Service, died at Rawal Pindi on 12th October, 1918, aged 32. He was born on 7th July 1886, the only son of Dr. George Sandison Brock, of Corso d'Italia, Rome, and was educated at Edinburgh University, where he graduated as M.B. and Ch.B. in 1910. He entered the I.M.S. as Lieutenant on 28th January, 1911, and was promoted to Captain on 28th January, 1914. At the beginning of the war he was Medical Officer of the 9th Bhopal Infantry. He had recently been appointed Adjutant of the School of Instruction for Temporary Officers of the I.M.S., at Rawal Pindi.

MAJOR JOHN HART McNICOL, R.A.M.C., died on October 1918. He was the son of John McNicol, of Dennistoun, Glasgow, and was educated at Glasgow High School and University, where he graduated as M.B. and Ch.B. in 1909, subsequently filling the posts of House Surgeon of Glasgow Royal Infirmary, and of Assistant to the Professors of Pathology and Materia Medica at that institution. He took a temporary commission as Lieutenant in the R.A.M.C. on 10th October, 1914, was promoted to Captain after a year's service, and subsequently to an Acting Majority. He had twice been mentioned in despatches, received the Military Cross on 3rd July, 1915, and was recently attached to the Suffolk Regiment.

COLONEL G. H. VAN ZYL, of the South African Medical Corps, died of pneumonia on 10th October, 1918, at Wynberg, Cape Province, aged 41. He was Commandant of Maitland Military Hospital.

CAPTAIN LAWRENCE CHARLES CROCKETT, attached R.A.M.C., died on 17th October, 1918, of illness contracted while serving at Malta. He was the son of James H. C. Crockett, of Dallington Lodge, Northampton, and was educated at Charing Cross Hospital, at the Royal Dental Hospital, London, and at Pennsylvania University, and took the L.D.S. of the London Colleges in 1905, and the degree of D.D.S. at Pennsylvania University in 1909. His commission as Captain was dated 20th April, 1917. Before the war he was in practice at Eastbourne.

CAPTAIN JOHN JAMES, R.A.M.C., was reported as killed in action, in the casualty list published on 22nd October, 1918, aged 37. He was born on 24th April, 1881, and educated at King's College, London, where he gained the Warneford Medical Entrance Scholarship, and the Sambrooke Medical Exhibition and second year's scholarship. He took the M.R.C.S. and L.R.C.P. London in 1903, the M.B. London in 1904, and the B.S. in 1906. After acting as Assistant House Surgeon and as Senior House Surgeon at Westminster Hospital, as House Physician of the Seamen's Hospital, Greenwich, and as Resident Medical Officer of Westminster Dispensary, he entered the R.A.M.C. as Lieutenant on 4th February, 1908, and took the De Chaumout prize in Hygiene at the Royal Army Medical College. He was promoted to Captain on 4th August 1911, and was attached to the Highland Light Infantry when killed.

CAPTAIN EVAN LAWRENCE JAMES, R.A.M.C., was reported as killed in action, in the casualty list published on 22nd October, 1918. He was educated at Guy's Hospital, and took the L.M.S.S.A. in 1913. He took a temporary commission as Lieutenant in the R.A.M.C. in April 1916, was promoted to Captain after a year's service, and was attached to the Highland Light Infantry when killed.

CAPTAIN DIGBY BURNS, R.A.M.C., was returned as drowned on service, in the casualty list published on 22nd October, 1918. He took the Irish double qualification in 1912, joined the R.A.M.C. as a temporary Lieutenant in January 1916, and was promoted to Captain after a year's service.

CAPTAIN A. A. PARKER, M.C., Canadian Army Medical Corps, was reported as killed in action, in the casualty list published on 22nd October, 1918. He received the Military Cross on 18th October, 1917.

SUBJECT to His Majesty's approval, the undermentioned to be temporary Lieutenants with effect from the dates specified:—

Saravanamuthu Thambiah, 20th July, 1918; Victor de Rosario, 11th September, 1918; Indubhushan Ghoshal, 12th September, 1918; Jamshed Dossabhoj Gazder, 16th September, 1918; Shankar Vishnu Velankar, 29th September, 1918; Surendra Nath Chatterjee, 6th October, 1918; Phani Mohan Ghosh, 7th October, 1918; Brajendra Nath Pal, 7th October, 1918; Gopal Das Sen, 11th October, 1918; Nani Bhusan Dutt, 17th October, 1918; Amarendranath Basu, 18th October, 1918; and Mulk Raj Sawhney, 18th October, 1918.

SUBJECT to His Majesty's approval and with effect from the 1st October, 1918, Brevet-Colonel Henry Francis Cleveland, C.I.E., V.H.S., is promoted to the rank of Colonel on temporary augmentation of establishment.

Colonel Cleveland's tenure of appointment will reckon from the 25th October, 1918.

SUBJECT to His Majesty's approval and with effect from the 3rd September, 1918, Lieutenant-Colonel John Blackburn Smith, C.B., M.R., is promoted to the rank of Colonel on temporary augmentation of establishment.

Colonel Smith's tenure of appointment will reckon from the 20th October, 1918.

THE undermentioned Senior Assistant Surgeons are retained in the service after the age of 55 years, until further orders, and will be borne as supernumerary in their rank and grade, with effect from the dates specified :—

Major Alfred Greenwood, dated 5th September, 1918; Captain Christopher Charles Augustus Wale, dated 20th September, 1918; and Lieutenant Joseph Mathias Nunes, dated 5th September, 1918.

THE services of Captain W. L. Forsyth, M.B., I.M.S., are placed temporarily at the disposal of the Government of Bihar and Orissa, with effect from the 22nd July, 1918.

MAJOR W. D. H. STEVENSON, C.I.E., M.D., I.M.S., is appointed to be additional Assistant Director-General, Indian Medical Service, as a temporary measure, with effect from the date on which he assumes charge of his office.

MAJOR W. TARR, M.D., F.R.C.S., I.M.S., whose services have been replaced at the disposal of this Administration by the Government of India, Army Department, is appointed to be Civil Surgeon, Jubbulpore.

HIS EXCELLENCY THE GOVERNOR OF BOMBAY in Council is pleased to appoint Major R. F. Steel, M.B., B.Ch., I.M.S., to be Superintendent of Mahableshwar, *vice* Mr. L. V. M. Robertson, I.C.S., deceased.

WITH reference to Army Department Notification No. 2483, dated the 25th October, 1918, Major F. C. Fraser, I.M.S., will take seniority in his present rank from 1st September, 1918, his previous forfeited service having been restored for good service in the field.

MAJOR (TEMPORARY LIEUTENANT-COLONEL) R. A. NEEDHAM, D.S.O., M.B., I.M.S., Assistant Director-General, Indian Medical Service (Sanitary), is appointed to be Deputy Director-General, Indian Medical Service, with effect from the afternoon of the 24th October, 1918.

THE *London Gazette* (November 18th) notifies the award of the following honours for good work in Mesopotamia :—

To be Officer British Empire.

Major S. R. Christophers, C.I.E., I.M.S.; and Major F. P. Mackie, I.M.S.

For services in East Africa.

Lieutenant-Colonel E. R. Rost, and Major C. E. Southon.

THE services of Major A. F. Hamilton, M.B., F.R.C.S., I.M.S., are replaced at the disposal of the Government of Bombay, with effect from the date on which he was relieved of his military duties.

MAJOR W. D. H. STEVENSON, C.I.E., M.D., I.M.S., Additional Assistant Director-General, Indian Medical Service, is appointed to be Assistant Director-General, Indian Medical (Sanitary) Service, with effect from the 14th November, 1918.

CAPTAIN E. A. PENNY, Indian Medical Service, is granted, subject to His Majesty's approval, the temporary rank of Major while holding the appointment of Deputy Assistant Director of Medical Services, with effect from the 1st November, 1918.

INDIAN MEDICAL DEPARTMENT.

Assistant Surgeon Branch.

Bombay Establishment.

THE following promotions are made, subject to His Majesty's approval :—

Senior Assistant Surgeon and Honorary Lieutenant Joseph Mathias Nunes to be Senior Assistant Surgeon with the honorary rank of Captain;

First-class Assistant Surgeons—

Lionel Scott,

Reginald William Pettigrew,

Frederick Russel Smith,

George Fredrick Andeen, L.A.H. (Dub.).

} *seconded,*

to be Senior Assistant Surgeons with the honorary rank of Lieutenant and to remain *seconded*;

First-class Assistant Surgeon Earnest Ebenezer Thipthorp to be Senior Assistant Surgeon with the honorary rank of Lieutenant;

vice Senior Assistant Surgeon and Honorary Major Albino Graciano Alphonso supernumerary on attaining the age of 55 years, with effect from the 24th August, 1918.

Senior Assistant Surgeon and Honorary Lieutenant George Robert Chamarett, *seconded*, to be Senior Assistant Surgeon with the honorary rank of Captain and to remain *seconded*;

Senior Assistant Surgeon and Honorary Lieutenant Louis D'Souza to be Senior Assistant Surgeon with the honorary rank of Captain.

IN Army Department Notification No. 2184, dated the 20th September, 1918, regarding the retirement from the service of Lieutenant-Colonel A. R. S. Anderson, M.B., I.M.S., Bengal for "1st August, 1918," read "11th September, 1918."

IN accordance with Rule 4 of the Regulations of the Central Provinces Medical Examination Board, the Chief Commissioner is pleased to appoint Major W. Tarr, M.D. (Edin.), F.R.C.S. (Edin.), I.M.S., Civil Surgn., Jubbulpore, to be a Member of the Board, with effect from the 8th October, 1918, for the unexpired portion of the term of three years, *vice* Lieutenant-Colonel W. H. Kenrick, L.R.C.P. (Lond.), M.R.C.S. (Eng.), D.T.M. (Liver.), I.M.S., Civil Surgeon, Jubbulpore, placed temporarily at the disposal of the Government of India, Army Department, for military duty.

LIEUTENANT-COLONEL A. W. R. COCHRANE, M.B., F.R.C.S., I.M.S., is appointed to be Professor of Medicine, King George's Medical College, Lucknow, substantively *pro tem.*, with effect from the date on which he took over charge of his duties, until further orders.

THE services of Lieutenant-Colonel W. B. Lane, C.I.E., I.M.S., Inspector-General of Prisons, Central Provinces, are placed permanently at the disposal of the Government of India, Army Department.

Colonel Lane, who has now been promoted to the rank of Colonel, has been for many years past Inspector-General of Prisons in the Central Provinces. His promotion will make a vacancy in that office. Indeed prospects in the jail department are good for promotion. Lieutenant-Colonel Henderson, of the United Provinces, and Sir Walter Buchanan, of Bengal, are both over age and due soon to go.

COLONEL JOHN CRIMMIN, V.C., C.B., C.I.E., V.D., K.H.P., is retained in the service, with effect from the 27th October, 1918, and will be borne as supernumerary in his rank and grade.

SUBJECT to His Majesty's approval and with effect from the 12th October, 1918, Lieutenant-Colonel Thomas Stodart, M.B., is promoted to the rank of Colonel on temporary augmentation of establishment.

Colonel Stodart's tenure of appointment will reckon from the 12th October, 1918.

Colonel Stodart entered the Madras Medical Service, on 29th July, 1893, and becomes full Colonel after 25 years' service. Promotion at his age, 50 years, is worth having.

Notice.

SCIENTIFIC Articles and Notes of interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements, and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscription to "*The Indian Medical Gazette*," Rs. 14, including postage, in India. Rs. 16, including postage, abroad.

BOOKS, REPORTS, &c., RECEIVED :—

Hughes and Bank's War Surgery. Price 30s. Baillière, Tindall, & Cox.

Calcutta Health Report.

Madras Medical Council Report.

Stewart's Physiology. Baillière, Tindall, & Cox.

M. D. Palmer's Lectures on Marriage. Fifth Edition.

Baillière, Tindall, & Cox.

Sanitary Report, Bengal.

Sanitary Report, Assam.

LETTERS, COMMUNICATIONS, &c., RECEIVED FROM :—

Colonel W. E. Jennings, I.M.S., Poona; Sir Leonard Rogers, Calcutta; Capt. D. J. Harris, R.A.M.C., Poona; Major C. H. Brodribb, I.M.S., Secunderabad; Lt.-Col. D. G. Crawford, I.M.S. (retd.), London; Major A. E. Lieter, I.M.S., Lucknow; Dr. Wouters, Colombo; Lt.-Col. C. C. Barry, I.M.S., Rangoon; Major Austin, R.A.M.C., Calcutta.

Original Articles.

AYURVEDA OF TO-DAY.

By W. D. SUTHERLAND, M.D.

LIEUT.-COL., I.M.S.,

Imperial Serologist.

FOR the study of the Ayurvedic System of Medicine as taught and practised in this twentieth century we have ample material at our disposal in the following work:—

"The Ayurvedic System of Medicine or an Exposition in English of Hindu Medicine as Occurring in Charaka, Susruta, Bhagbata and other Authoritative Sanskrit Works, Ancient and Modern. By Kaviraj Nagendra Nath Sen Gupta. 3 vols. Calcutta: Revised Edition, 1909."

In his preface the learned Kaviraj writes:

I have in the following pages endeavoured to achieve a desideratum that has been long felt. The present work is the first of its kind. For the first time a complete exposition is offered of what is contained in Hindu Medical Treatises about disease and its cure. There is nothing in the publications of Dr. Wise and Dr. Dutt that the reader will not find in the following pages. At the same time, there is much in this book which is not included in those works. . . . My endeavour has been to reproduce in each Chapter the contents, in a condensed form, of larger works on Hindu Medicine. I have, in a few places, inserted the results of my own experience. The descriptions of the diseases have generally been taken from Charaka and many later works. In publishing the present work, which is in English, my object is to place before the English-speaking world, and particularly before physicians and surgeons practising the Western method of medicine, the knowledge which the Rishis had of disease and its cure.

We shall now see how well the task which the author set himself to do has been done.

I. The virtues of *dailyunction of the body* are thus described:

The use of oil makes the body firm, enhances its growth, imparts to it the capacity to endure fatigue and pain, renders the skin agreeable to the touch, and improves the complexion; further it keeps off decrepitude, dispels fatigue, checks all disorders brought about by vitiated wind, and promotes longevity. Oil, rubbed on the head, prevents baldness or alopecia, canities, or premature whiteness of the hair, as also its decay or falling away. It strengthens the head and forehead and the roots of the hair, promotes the growth of hair and gives it a fine dark colour. All the organs of the person who rubs oil on the head become cheerful, and sound sleep visits him at night.

The other salutary effects of this practice are freedom from restlessness, increase of strength, delicacy of all the limbs, and vigorous vision.

By rubbing oil in the orifices of the ears, deafness is prevented, as also wry neck and dislocation of the cheek-bone, and other disorders of the face and head which are due to excitement of the wind. (I., 3, 4.)

II. Although the *siesta* is to be permitted to children and sick persons, it is a dangerous practice for those that are well, because:

One should never sleep during day-time after eating. Such sleep excites phlegm and bile and brings on such diseases as jaundice, painful headaches, languor and unsteadiness, as also heaviness of the limbs, loss of lightness of the body, loss of appetite, dropsical swellings, hiccup, inflammation of the Schneiderian membrane, loss of memory and intelligence, hemicrania, urticaria evanida, eruptions, itches, procrastination, consumption, sore throat, nervous debility, fever and weakness of all the senses. (I., 7.)

III. Many treatises on the *Hindu science of the pulse* have been written, so it is with much sympathy that we give the author's teaching:

In the case of male patients, it is to be felt at the wrist of the right hand, and in that of female patients at that of the left hand.

Again, the pulse of a healthy adult is not uniform all day long. In the morning it appears to be cool; at mid-day, it seems to be hot; while in the evening it becomes quicker. (I., 20.)

Generally it is said that in any disease due to excitement of the wind, the pulse is said to assume a curvilinear motion. In any disease due to excitement of the bile the pulse becomes quick. In any disease due to the excitement of the phlegm, the pulse-beats become slow, regular, and heavy. The curvilinear motion, under excitement of the wind may, it is said, be like the course of a serpent, a leech, etc. The quickness of the pulse due to the excitement of the bile may be, it is said, like the motion of the crow, or of the francoline partridge, or of the frog. The slow, regular, and heavy pulse, which is due to excitement of the phlegm, it is similarly said, resembles the motion of the swan, the peacock, the pigeon, the dove, the cock, etc. When fever has set in, the pulse becomes hot and quick. After sexual congress the pulse becomes hot but not quick. Indeed, this is the difference between the pulse in fever and the pulse after sexual congress. (I., 20, 21.)

In intermittent fevers, appearing on alternate days, the pulse is sometimes felt at the root of the thumb and sometimes by its side. (I., 24.)

How very exact the Ayurvedic practitioner is taught to be in *prognosis* is shown by the following remarks:

If the pulse of a patient, having coursed quickly for some time, becomes slow or very slow at once, and if the patient is not suffering under any dropsical swelling, death comes on the seventh or eighth day. If the pulse sometimes becomes weak and smooth and curvilinear in its course, and sometimes strong and full and curvilinear, and sometimes again, very weak and even imperceptible, or if the pulse becomes weak or full, agreeably to the leanness of the body or its obesity due to dropsical swellings, death comes about a month after. If the pulse falls off by the breadth of half a barley-seed from the root of the thumb, death comes within three days, without doubt. If the pulse be perceptible only below the second finger without being perceptible below the third and the fourth, death comes on the fourth day. If in fevers due to excitement of all the faults, the heat of the body be excessive but the pulse very cool, death takes place at the end of third day. If the pulse for a few seconds becomes very quick, and then becomes imperceptible, and again becomes quick and then imperceptible, death takes place within one day. If the pulse becomes sometimes perceptible at

the end of the second finger and sometimes imperceptible, death takes place within a day and a half. The person, whose pulse beats once or twice as quickly as a flash of lightning at the end of the second finger and then disappears, dies within four and twenty hours from the commencement of such a phenomenon. One whose pulse falls off from the root of the thumb and becomes perceptible for only a few seconds, and who experiences a burning sensation in the heart, meets with death as soon as the burning sensation ceases. In other words, his life continues as long as the burning sensation lasts. (I., 27, 28.)

IV. The *examination of the urine by means of oil* is detailed. The passage runs:

The urine that is vitiated by the wind becomes oily and pale, or of that darkish hue which is the result of a mixture of black and yellow, or even of a reddish hue. If a drop of oil be poured upon such urine, it spreads all over the surface and small bubbles forthwith begin to rise, topped by minute particles of oil. The urine that is vitiated by bile assumes a red colour. If a drop of oil be poured upon it, bubbles begin to rise. The urine that is vitiated by raw bile looks like the oil of white mustard seeds. The urine that is vitiated by phlegm is frothy. It looks very much like the muddy water of a small pond. If a drop of oil be poured upon urine vitiated by wind and bile, bubbles will begin to rise of a darkish colour. By pouring oil upon urine vitiated by wind and phlegm, the urine becomes immediately mixed with the oil and looks like fermented gruel of rice. The urine that is vitiated by both bile and phlegm becomes of a pale colour. If all the faults are excited, the colour of the urine becomes either red or black. (I., 30, 31.)

V. Of the *tongue in disease* we read:

If the wind predominates in the constitution, the colour of the tongue resembles that of the leaves of the teak

If the bile predominates, the tongue presents a red or darkish hue; while if the phlegm predominates, it becomes white and thick. The prickles over it become confluent, and it constantly secretes saliva. (I., 33.)

It is clear that here observation is over-shadowed by "authority."

VI. Most of our readers have heard of *Sannipata fever*, which is caused by derangement of wind, bile and phlegm. From the description given we cull these flowers (the italics being ours):

Fevers born of the three faults (excited simultaneously) are called "*Sannipatika*." In common parlance these are known by the name of "*Jwaravikara*" (or perverted fevers). In this fever, alternate sensations of burning and cold are repeatedly experienced. Pain in all the bones, joints and head, is another marked symptom. The other symptoms are tearful eyes, or eyes of a muddy hue, or deep red. They also become expanded. The corners sometimes fall down . . . a certain stage of this "*Sannipata*" fever is called by European physicians by the name of *Pneumonia*. (I., 43, 44.)

Here follows a good account of the general symptoms of *pneumonia* with a description of the sputum, but, though professing to give modern practice, the author omits all mention of the physical signs to be observed. The reason is that the Sages did not mention these, so they should not be noted. Of the prognosis, we learn that:

Sannipata fever is never easy of cure. If the stools and the wind and other faults are tied up, all the symptoms are strongly manifested and disease becomes incurable. If the reverse of this occurs, the disease becomes curable, but great care is necessary. (I., 45.)

A severe form of this fever is called *Abhinyasa*. When the wind and the other faults, exceedingly excited, enter the ducts of the chest and become mingled with the *āma-rasa* (the juice into which food is converted in the first stage of digestion) and affect the organs of knowledge and the mind, the result becomes terrible. (I., 46.)

VII. The important subject of the treatment of fever is discussed at length. We quote the following (the italics are ours):

In acute fever, *langhana*, or fast, should be observed at the outset. By this, the excited wind or bile or phlegm arrives at a state of maturity; the digestive fire begins to blaze up; the body becomes light, the fever abates in force, and the appetite returns. (I., 55.)

If the patient becomes unconscious, the following may be administered as a cerebral purgative: take in equal quantities some roots of *Piper longum*, rock-salt, and flowers of *Piper longum* and of *Dioscorea aculeata*. These should be reduced to powder. With a measure of this powder should be mixed an equal quantity of black pepper reduced to powder. It should then be dissolved in a quantity of hot water. It is this hot water that should be frequently administered as a cerebral purgative. The patient will then recover consciousness, and such symptoms as sleepiness, delirium, and heaviness of head, will disappear or be considerably alleviated. For curing sleepiness, a cerebral purgative may be used, consisting of the following articles taken in equal quantities, viz., rock-salt, seeds of *Moringa pterygosperma*, mustard seeds of the white variety, and *Apotaxis auriculata*. This should be reduced to a paste with the urine of the goat. A collyrium, applied to the eyes of the patient, made of the following substances, will bring back consciousness; seeds of *Mimosa sirisa*, *Piper longum*, black pepper, rock-salt, garlic, realgar, and *Acorus calamus*. These should be taken in equal quantities, and a paste should be made of them with cow's urine. (I., 60, 61.)

The disease which in European medicine is called *Pneumonia* is not, according to Hindu physicians, a separate disease. It is a stage of fever due to the excitement of all the three faults. In that stage the remedies to administer are several *Pachanas* already mentioned, as also *Lakshmi-vilasa*, *Kasturi-bhairava*, *Kapha-ketu*, and those varieties of medicines which are prescribable in phthisis. These remedies require great discrimination in their application, for their potency is very great. (I., 62.)

Where *hiccup*, *nausea* and *vomiting* are distressing the patient, the following preparations are recommended to be used:

The dung of the honey-bee, mixed with honey and sandal-paste, or with sugar, if licked, may alleviate nausea or vomiting. Three or four grains of the dung of the cockroach should be dissolved in a quantity of cold water. A spoonful or two of this water, repeated twice or thrice, will alleviate vomiting. (I., 65.)

The intestines of cockroach with black pepper of about half the measure should be reduced into a paste. About a rattī of this should be dissolved in a quantity of cold water. This water taken twice or thrice is sure to alleviate the most violent hiccup in no time. (I., 67.)

For allaying intermittent fevers that appear at night-time, some recommend the tying up of a piece of the root of *Solanum nigrum* to one of the ears of the patient. (I., 71.)

The well-known pills made by us, viz, *Panchatikta-vatika*, are a remedy of very great efficacy in almost all kinds of fever, acute or chronic (Ibid.)

Under injudicious treatment, according to the Western method, quinine is frequently administered to patients in even acute stage of fever. The result that happens is that the fever, instead of being cured, is only suppressed so as to re-appear if the patient ceases to adhere to the sick-regimen. (I., 73.)

VIII. *Enlargement of the spleen*, so common in India, is described at some length. Its etiology is thus set forth :

The spleen becomes enlarged if fever is allowed to remain uncured for any length of time. Malarial fever, as also residence in any place where malarial fever is raging, leads to enlargement of the spleen. If the blood increases in quantity owing to indulgence in sweet and oily food, the spleen becomes enlarged. If, again, one travels in a fast vehicle immediately after heavy meals, or indulges in excessive labour, the spleen falls off its place and begins to enlarge. (I., 76.)

The treatment is "keeping the bowels clean," to which end, amongst other means, the following are recommended :—

The roots of *Plumbago zeylanica* should be reduced to a paste and divided into pills, each of the weight of one ratti. Three pills should be given, each inserted within a ripe plantain. (I., 77.)

Our *Panchatikta pills* are very efficacious in fever with enlargement of spleen. (I., 79.)

IX. *Derangements of the liver* are dismissed in a couple of pages, and their treatment succinctly described as being "the same as in disorders of the spleen." After all, the liver as a viscus is of only slight importance in a system of which one of the three vital principles is bile.

X. From the description given, it would appear that it is an easy matter to differentiate immature from mature *diarrhoea*, and that the differentiation is of supreme importance :

As long as the stools are greasy and of a very fetid scent and sink when thrown into water, the diarrhoea is called *Amatisara*, i.e., immature, or that caused by undigested juices. When the stools lose their foetid scent, as also their slippery or lardaceous quality, and when they float on water instead of sinking down to the bottom, the diarrhoea is regarded as mature. (I., 87.)

In no form of diarrhoea, during the immature state, should astringent drugs of any kind be administered. If administered at such a stage, the medicines operate most injuriously. By stopping the escape of the vitiated faults, they induce dropsical swellings, anæmia and jaundice, enlargement of the spleen, leprosy, abdominal tumours, fever, rigid spasms, tympanites, flatulence, inflammation and ulceration of Grahani, piles and various other diseases. (I., 88.)

XI. That the word *piles* in Ayurvedic parlance connotes more than it does in the West is clear from the following :

Besides the rectum, piles or hæmorrhoids manifest themselves in the penis, the nose, the ears, and certain other parts of the body. (I., 104.)

Generally speaking, piles are of six kinds, viz., wind-born, bile-born, phlegm-born, that born of all the three faults, blood-born and constitutional. I., 105.

If either of the parents or both have piles, or if at the time of begetting the child either or both of them indulge in those practices which generate piles, the child then gets piles constitutionally. This variety of the disease is called Constitutional piles. In this disease, the fleshy excrescences assume ugly forms. They become rough and hard, and either red or pale in colour. Their ends are directed inwards. The patient becomes lean or emaciated. He eats very little. His digestive fire is weak. His voice becomes weak. His disposition becomes wrathful. His body becomes covered with swollen veins. His virile power becomes weakened, and he becomes afflicted with diseases of the eye, the ears, the nose, or the head. A rumbling noise is generally heard in his stomach and intestines. The chest becomes heavy, as if covered with a wet cloth. Disgust for food is another supervening symptom. (I., 108.)

XII. Of *cholera* we read (the italics are ours) that it "*is a disease which did not exist in ancient times.*" (II., 284.) Its etiology is thus described :

Excessive rains, and still air, excessively hot air, impure water and air, excessive labour, irregularity of diet, mental torture in consequence of terror, sorrow and grief, residence in a thickly populated quarter, debility of the body, night-keeping, are the causes of the disease. (I., 122.)

As to its well-known symptoms, we read :

If the wind be more excited than the other two faults, then vomiting and purging do not become excessive

If the bile be excessively excited, then purging becomes copious

If the phlegm be excited more than the bile and wind, vomiting becomes copious. . . . (I., 123.)

XIII. The description of *worms*, to which we would refer the reader, is in need of revision, for it includes lice. It is noteworthy that the cure is easy, for (the italics are ours) :

Our own preparation, known by the name of *Krimi-ghnatini-vatika* is an efficacious remedy in worm diseases. (I., 135.)

XIV. *Bronchitis*. The varieties of this disease are not those usually described in textbooks of medicine.

In the wind-born variety, piercing pains are felt in the chest, forehead, sides, stomach, and head. The mouth becomes dry; the strength becomes reduced; there is a constant urging to cough; hoarseness of the voice and a dry cough not followed by expectorations of phlegm. In the bile-born variety, there is a burning sensation in the chest. The other symptoms are fever, dryness of the mouth, a bitter taste in the mouth, thirst, vomiting, the matter thrown out being generally yellow and of pungent taste. The complexion becomes pale, and there is burning pain in the throat while coughing. In the phlegm-born variety, the mouth of the patient is always filled with phlegm

Eating such food as is detrimental, irregular meals, that is, eating excessively one day and sparingly another day or at irregular times, excessive indulgence in sexual pleasure, suppressing the urgings of stool and urine, self-condemnation for want of food, or grief for such want, vitiate the digestive fire and excite the three faults. This leads to cough born of consumption. (I., 155, 156.)

XV. For the treatment of *asthma*, we find *datura* and nitre-paper recommended to be smoked; also (the italics are ours):

Keeping a number of peacock-plumes in a covered vessel and reducing them to ashes on a slow fire, and mixing therewith a quantity of the fruit of *Piper longum* reduced to powder, make a linctus with the aid of honey. If licked now and then, it alleviates the intensity of asthmatic breathing and violent hiccup.

(I., 165.)

Our own *Swasarishta* is an excellent remedy in *asthma*. It promptly alleviates difficulty of breathing and gradually cures the disease completely (I., 166.)

XVI. Of *thirst*, which, by the way, is regarded as being a disease and not merely a symptom, the author writes (the italics are ours):

In wound-born thirst, the juice of meat and blood do much good. In waste-born thirst, milk, water with honey, and the juice of meat are beneficial. In food-born thirst, the administration of emetics is the best treatment.

The juice of grapes or that of the sugarcane, or milk, or the decoction of liquorice, or honey, or the juice of Sundi fruit, if drunk through the nose, checks the most severe and obstinate cases of thirst. (I., 178.)

XVII. Our author's *treatment of alcoholism* is not likely to please the total abstinence fanatics:

Drinking alcoholic wines constitutes the best treatment of all diseases due to intoxication. When the diseases have been generated by drinking wines in excessive measure, the patient derives benefit by drinking in proper measure. In delirium tremens, after the wine taken has been digested, the patient should take a little more wine diluted in water and mixed with Sanchal salt, dry ginger, *Piper longum*, and pepper, each reduced to pulv. In that variety of the disease which is characterised by excitement of the bile, old and cooling wines mixed with sugar and the juice of grapes, and the fruit of *Phyllanthus emblica*

In that variety which is characterised by excitement of the phlegm, the patient should be made to vomit by giving him wines mixed with emetics. After this he should be made to fast according to his strength. (I., 186.)

The following careful directions as to *how to avoid the effects of indulgence in the cup* are interesting:

If immediately after drinking wine one licks sugar mixed with ghee, no intoxication is produced. The intoxication generated by eating rice obtained from the paddy called Kodo, may be prevented by water in which has been dissolved the pulp of *Cucurbita pepo* and treacle. The intoxication produced by chewing betelnuts is allayed by drinking cold water to one's fill. The smell of dry cow-dung, as also eating a little salt, allays this kind of intoxication. The intoxication produced by eating the fruit of *Datura fastuosa* is allayed by taking milk with sugar. For allaying the intoxication produced by bhang (leaves of *Cannabis sativa*), warm ghee, the expressed juice of the leaves of jack, the infusion of tamarind pulp and the water of unripe coconuts are efficacious. Another effective remedy is hot water. The doses have, however, to be repeated. The action is instantaneous. A glass or two of brandy also checks the action of bhang, without producing the intoxication of brandy. (I., 187.)

XVIII. The treatment of *epilepsy* and *hysteria* is described thus (the italics are ours):

As soon as the disease manifests itself, treatment should begin; for, if allowed to remain for some time without treatment, it becomes incurable. In epilepsy, as in swoons, for restoring the patient to consciousness, water should be sprinkled upon the face and the eyes. If this does not succeed, a collyrium may be supplied, made of realgar, galena, and pigeon's dung, pounded together with honey. Liquorice asafetida, the fruit of *Acorus calamus*, the bark of *Tabernemontana coronaria*, the seeds of *Mimosa sirisa*, garlics, and *Aplotaxi auriculata*, pounded together with cow's urine, form a good errhine, as also collyrium. These two varieties of collyrium and this errhine prove beneficial in insanity also. Even old cases of epilepsy are considerably alleviated by an errhine made of *Nardostachys jatamansi*, as also by inhaling its smoke. *By drinking the cold water into which has been thrown the ashes of a string or rope with which one has strangled oneself, relief may be obtained in epilepsy.* (I., 199.)

In *hysteria* of females, our own *Murchchāntak Taila* and *Kumudāsava* are very efficacious. (I., 200.)

XIX. That *nervous diseases* are many and their treatment difficult is clear from the following passages:

The use of food that is dry, cold or light or scanty, excessive indulgence in sexual congress, night-keeping, excessive vomiting, and purging; excessive loss of blood, taking long leaps, excessive swimming in water, fatiguing walks, grief, anxiety, waste of the ingredients of the body through disease, suppression of the urgings of stools and urine, wounds, fasts, falling down from running vehicles and other causes of a similar kind provoke the wind and produce diverse varieties of nervous disease. The wind may be vitiated in numberless ways. In medical treatises eighty forms are referred to, but names have not been applied to all the forms

When the excited wind fills up the nerves, it convulses the body in all manner of attitudes (I., 200, 201)

In consequence of always speaking aloud or chewing hard substances or loud laughter, or yawning, or carrying heavy loads or lying in uneven attitudes or on uneven places, the wind becomes excited and turns half the face with the neck towards either the right or left side. The other symptoms that manifest themselves are shivering of the head, suspension of speech, and diversion and displacement of the eyes. (I., 202.)

If the feet lose the sensation of touch and become subject to constant horripilation and the sensation known as pins-and-needles, the disease is called *Pada-harsa*. It is first stage of leprosy. This disease is produced by both the wind and phlegm being excited together (I., 204.)

When the wind becomes confined in that part of the stomach where digestion takes place, causes it to swell and make a rumbling noise accompanied by pain, the disease is called flatulence (I., 205)

The common treatment of all forms of nervous disease is the use or application of medicated ghees and oils. (*Ibid.*)

XX. An interesting disorder is that described thus:

By eating in large measures food that is cold, hot or liquid or hard, or heavy or light or oily or dry, by filling the stomach with food before the food last taken has been digested, toil, exercising the body too much, sleep at day time, night-keeping, and similar causes excite the wind, which, in its turn, vitiates the blood and the bile. When the vitiated blood and bile find

their way into the thigh, they produce the disease called Paralipsia. The thigh becomes stupefied, cold, without sensation, heavy and painful; the patient loses the power of moving or raising it. The mind becomes full of anxiety. Pains are felt in other parts of the body. The patient experiences a sensation of his body being wrapped round with a wet cloth or blanket. The other symptoms are drowsiness, vomiting, nausea, fever, stupefaction of the particular leg affected, loss of the sense of touch, and great difficulty and pain in moving the limb. Paralipsia (*Urustambha*) is otherwise called *Adhya-vāta* (probably, Rheumatism of the Rich). The symptoms that precede this disease are excessive sleep, great mental distress, stupefaction of the body, fever, horripilation, disgust for food, vomiting and weakness of both the calves and the thighs. (I., 213, 214.)

Such measures as alleviate the phlegm without exciting the wind constitute the best treatment of *Paralipsia*. (I., 214.)

XXI. Of *calculus* we read:

The excited wind dries up the urine and the semen, or both the bile and the phlegm. The result is the formation of hard substances, called calculi, in the kidneys.

Calculi are supposed to be generated by the wind, the bile, the phlegm, and the semen, each rendered morbid by distinctive causes that are known to excite it. (I., 248.)

XXII. The symptoms of *gonorrhœa* are well described, but for its cure the author vaunts his own specific (the italics are ours):

Our Pramehabindu is a specific for this kind of Mehu. It is sure to cure the disease quickly. If this disease is not cured perfectly, it develops into *Sukrameha* (thinness of the semen), and gradually into impotency. Bathing or any sort of cool operation is strictly forbidden. Though cooling operations seem to alleviate the disease at first, in the end they generate pain in the joints and may even make the patient incapable of moving his limbs. (I., 257.)

XXIII. He teaches regarding *œdema* that:

If one eats food which contains alkaline ashes, or which is sour or of keen virtues or hot, or heavy, when one has been emaciated and weakened by observance of fasts or the use of food of inharmonious ingredients, or by such diseases as fever, diarrhœa, grahami, jaundice, piles, hæmorrhage due to excitement of the bile, and enlargement of the spleen or of the liver, or by the administration of emetics and other correctives, one is attacked by the disease called *œdema* or inflammatory swelling. Other causes, such as the taking of curds, or unripe articles, or earth, or potherbs, or food consisting of such inharmonious ingredients as milk and fish, lead to this disease. If again one does not take emetics or purgatives when one requires them, or if emetics or purgatives be not administered in sufficient and proper measure, this disease manifests itself. Women, after abortion or premature delivery, are generally attacked by it. Wounds also, inflicted on vital parts, produce this ailment. The excited wind, forcing the vitiated blood, the bile, and the phlegm into the outer ducts of the body, and itself becoming obstructed by them, causes the skin and the flesh to swell up. This disease is called *œdema*. (I., 272, 273.)

XXIV. That mercury should be given with great care in *sypphilis* is clear from this passage (again the italics are ours):

If the mercury taken be not of the kind that has been properly corrected, or if it is administered without the

necessary precautions, the consequence is that entering the system it produces diverse diseases of severe types. Burning sensation in the bones, pains in the joints or all over the body, ulcerations or the appearance of pimples in various parts of the body, black or dark spots on the body, peeling off the skin from the palms and the soles, sores in the mouth and nose, inflammation of the schneiderian membrane, diseases of the mouth, falling off of the teeth, loss of the nose, headaches, paralysis, inflammation of the scrotum, enlargement and inflammation of the glands producing swellings that resemble cystic tumours, diseases of the eye, fistula-in-ano, various kinds of skin-diseases, and even tubercular, spring from the improper administration of mercury. *In these ailments the use of our Amritavalli-kashaya is advisable; it is, indeed, the best medicine that can be prescribed for these diseases.* (I., 296, 297.)

XXV. *Small-pox* is a common enough disease, but the influence of "authority" is too great for the author to describe it otherwise than as follows, (the italics are ours):

Food consisting of such inharmonious ingredients as milk and fish, food that is vitiated, the variety of *dolichor* called *Simbi*, potherbs, such articles of diet as are pungent, sour, or saline, or as consist of alkaline ashes, loading the stomach with food before the food last taken has been digested, and other causes of similar nature lead to the appearance of small-pox. The disease is called *Masurika*, because the shape and size of the eruptions resemble those of *Masura*, or the seeds of *Cicer lens*. The premonitory symptoms are fever, itching pain in the body, restlessness of the mind, vertigo, swelling of the skin, redness of the complexion, and redness of the eyes. The disease appears, afflicting particular dhātus of the body. Hence it has several varieties. When the disease affects the ingredients called *Rasa*, that is the juices into which the food taken is first transmuted, the eruptions take the form of bubbles on the surface of water. Covered with a thin coating, they are filled with water and their appearance is like that of swelling caused by scalds. When they burst, discharges take place from them of watery matter. This kind of pox is easy to cure. In common parlance, it is called *Pāni-vasanta*, i.e., water-pox. When the disease affects the blood, the eruptions assume a red hue; their coatings are thin. They soon suppurate; and when they burst, discharges occur of bloody matter. If the blood be not very much vitiated, this variety of pox is curable. When the malady affects the flesh, the eruptions are hard, oily, and covered with thick coatings. Severe pains, like to what is caused by *Sula*, occur. Thirst, itching, fever, and restlessness of the mind appear. Pox that affects the adeps, assumes a circular shape. It is soft, more elevated than usual, thick, bright and painful. The supervening symptoms are violent fever, mental delusions, restlessness of the mind, and heat. In pox, that affects the bones and the marrow, the eruptions are small, dry, flat, and slightly elevated. Their colour is like that of the body. The supervening symptoms are coma and delusions, violent pain, restlessness of the mind, and pain in every part of the body like to what is caused by the bite (*sic*) of the hornet. The patient feels as if his vital parts are being torn out. Pox that affects the semen is bright, minute, and very painful. Seemingly ripe, they are in reality not so. The patient feels as if his body is wrapped round with a wet cloth or blanket. The mind becomes restless. Swoons, heat and a sense of inebriation also appear. (I., 318, 319.)

Vaccination is regarded as a good preventive. Formerly inoculation was resorted to in this country very extensively. Inoculation, however, has been

declared illegal, and vaccination has latterly come to be doubted by many eminent physicians of Europe, yet till a better substitute is found it should not be abandoned. *Another preventive is the seed of the Chebulic myrobalans. Women should wear it on the left arm and men, on the right arm. The efficacy of these seeds thus worn has been tested during many epidemics.* (I., 324, 325.)

XXVI. Of diseases of the eye, we read:

By suddenly plunging into cold water after exposing oneself to the sun, by looking for a long time at a distant object, by constantly looking at minute objects, by sleeping at day-time, by night-keeping, one gets diseases of the eye. Such causes also as the accession of sweat, dust and smoke into the eye, suppression of the urgings of vomiting or excessive vomiting, eating liquid food at night, suppression of the urgings of stool, or urine, and of the downward wind, crying often and each time for too long a period, indulgence in wrath and grief, wounds on the head, excessive drinking, change of seasons, checking the flow of tears, etc., excite the faults and bring about different kinds of eye-diseases. There are many diseases of the eye. Most of them require surgical operations for their cure. Many, again, are incurable (I., 355.)

For curing redness of the eye, water in which alum has been dissolved, or rose water, should be given. *Our Netrabindu is a highly efficacious remedy for all varieties of ophthalmia.* For curing swelling of the eye, fomentation should be resorted to, using the boiled fruits of opium as the heating agent. (I., 357.)

XXVII. From the chapter on the disorders of pregnant women, we learn:

If the labour be protracted, the roots of *Gloriosa superba*, pounded into a paste with kanji, should be applied on the soles of the feet. The roots of *Justicia adhatoda* should be tied to the waist, or plasters made of those roots reduced to a paste should be applied on the navel, the rectum, and the mouth of the uterine canal. The other medicines that induce prompt delivery are: (1) soot pounded with kanji; (2) the roots of *Citrus medica* (variety *Acida*) and liquorice, pounded together with ghee; and (3) the fruit of *Grewia asiatica*, *Hedysarum gangeticum*, *Cissampelos hernandifolia* and the roots of either *Gloriosa superba* or *Achyranthes aspera*, the roots of *Artemisia vulgaris*, and the roots of *Plumbago zeylanica*, taken in equal measures and pounded together. The dose of each of these medicines should be 4 annas. (I., 378.)

If during pregnancy the wind be excited, the result is that the body of the woman begins to dry up. The foetus also dries up. The remedy in such cases is milk boiled with liquorice and the fruit of *Gmelina arborea*. Another medicine that does good is ghee boiled with *Tinospora cordifolia*, *Batatas paniculata*, *Physalis flexuosa*, *Asclepias pseudosarsa*, *Asparagus racemosus*, *Phaseolus trilobus*, *Glycine debilis*, *Celogyne ovalis*, and liquorice. (I., 379.)

XXVIII. Of bites by venomous animals and reptiles, we read:

If one is bit by a snake when one is at the foot of an *Aswattha* (*Ficus religiosa*) tree, or in a crematorium, or upon an anthill, or at a place where four roads meet, such bite generally proves fatal. The simple reason is that hooded snakes of virulent poison generally reside in such places. Similarly, if one is bit in the morning, or the evening, or at a time when the constellations Bharani, Ardra, Magha, Aslesha, and Kirttika are in the ascendant, the bite ends fatally. A person bit in any of the vital parts of the body seldom recovers. If no blood, even

when wounds are inflicted with a knife, issues from the body of a person that is bit, he meets with death. If no marks appear on the body of a bitten person who is scourged with whips, the result proves disastrous. If cold water repeatedly sprinkled on the body of a bitten person does not produce horripilation, the bite ends in death. If the face of a bitten person becomes curved, if his hair comes off when pulled, if he cannot keep his neck erect, if the lock-jaw appears, if a red or dark swelling appears on the bitten part, if salivary secretions fall from the mouth in streams thick as wax-candles, the result frequently becomes unfavourable. If again the marks of four teeth be visible on the bitten part, the case becomes incurable. (I., 402, 403.)

Sometimes a frog bites a man. The consequences are thirst, sleep, vomiting, swelling with pain, and the appearance of small pimples on the bitten part. There is poison in the semen of rats and mice. If a person comes in contact with such semen, the symptoms of poison appear in his body. (I., 403.)

Take in equal measures the pulv. of the following, viz., realgar, yellow orpiment, pepper, white arsenic, hingula, the roots of *Achyranthes aspera*, those of *Datura fastuosa*, those of *Nerium odorum*, and those of *Mimosa sirisa*; drench the compound a hundred times (according to the process called Bhavana) in the juice of *Elaeocarpus ganitrus*, as also of *Olitoria ternatea*; and divide it into pills of the size of the grains of *Phaseolus mungo*. These pills can revive a person who has become insensible through the action of snake-bite or poison swallowed. This medicine is called Bhima-rudrarasa. (I., 411.)

XXIX. To Revivalists we recommend the following judicious pronouncement:

When people give way to excessive religious emotion, the wind in their constitution, becoming excited, brings on a swoon or fit of unconsciousness. Such swoons are not rare among the Vaishnavas of Bengal when they are engaged in chanting aloud the praises of Vishnu in singing parties. The nature of these fits of unconsciousness is not correctly understood by the friends of those who are subject to them, for these are regarded as a state of communication with the deity. The truth is, a swoon brought about by religious excitement is a disease which, if not treated, injures the constitution and at last brings about death. (I., 418.)

Having cursorily treated the author's exposition of pathology and therapeutics, we come to the *Pharmacopœia*. As every one of our readers knows, extravagant claims have been advanced for the Ayurvedic pharmacopœia, whose virtues have been extolled dithyrambically by all and sundry, whether *illuminati* or not. We shall not undertake a *résumé* of the two volumes devoted to drugs, but shall confine ourselves to the citation of certain important passages.

A. When no particular liquid is mentioned, water should be taken. When no specification occurs—for Utpala, Nilotpala (*Nymphaea stellata*) should be taken; for Purisharasa, the expressed juice of cowdung should be taken; for Chandana (sandal-wood), Raktachandana (*Pterocarpus santalinus*), or red sandal-wood, should be taken; for mustard seeds, only the white variety; for salt, only Saindhava salt; for urine, only cow's urine; and for milk and ghee, only cow's milk, and ghee prepared from cow's milk, should be taken. When flesh is mentioned of four-footed animals, the flesh of female animals should be taken. When the flesh of birds is mentioned, that of male birds should be understood.

As regards goats, the flesh should be taken of hermaphrodite ones; and when flesh is mentioned of the jackal, the male animal should be utilised. If a hermaphrodite goat be not available, the flesh of a she-goat that is sterile may be taken. In all medicines, articles that are fresh should be used; only treacle, ghee, honey, coriander seeds, and the fruits of Pipali (*Piper longum*) and Biranga (*Embelia ribes*) should be old. (II., 4.)

B. If the bile or phlegm be excited, the time for taking the medicine is the morning. For the administration of purgatives, emetics and other correctives, the morning also is the proper time. If among the five life-breaths, it is the Apina that has become vitiated, one should take medicine before meals. For conquering the excitement of the Vyana, medicine should be taken after meals. If the Udana be excited, medicine should be taken with one's evening meals. For correcting the faults of the Prāna, medicine should be taken after the evening meals. In hiccup, convulsions, shivering and other diseases in which the wind is predominant, medicine should be taken before and after meals. (II., 14.)

C. When iron is burnt, its filth comes out. This filth is called mandura. Mandura that is a hundred years old or more, should be used medicinally. At least that which is sixty years old may be taken. Mandura which is less than sixty years old should never be used. It should be burnt and then dipped in cow's urine. The burning and dipping should go on for seven times. It should then be reduced to powder and subjected to roasting. (II., 23.)

D. Diamond is first purified by being inserted into a piece of root of kantakari (*Solanum xanthocarpum*) and boiling it in the decoction of the seeds of kulattha (*Dolichos biflorus*) and the paddy known as kodu, for three days, tying it in a piece of hanging cloth. The purification being completed in this way, the diamond should then be burnt in a fire and dipped in the decoction, mixed with hingu (*asafoetida*) and Saindhava salt, of the seeds of *Dolichos biflorus*. This should be done for twenty-one times. The result will be a fine dust fit for use. (II., 25.)

E. The poison of black cobra (*Krishna-sarpa*) or krait is taken for medicinal purposes. The poison should be first mixed with mustard oil and dried in the sun. It should then be macerated, first in the expressed juice of betel leaves, then in the expressed juice of the leaves of baka (*Sesbania grandiflora*), and lastly in the decoction of kura (*Aplotaxis auriculata*). The process of maceration in each should be repeated three times. (II., 26.)

F. The name Jwarankusa implies the goad against fever, that is, a medicine which controls fever like a goad in the hands of the driver controlling an elephant or any other beast. The ingredients are 1 part of mercury, 2 parts of sulphur, 3 parts of cinnabar, and 4 parts of croton seeds. These are pounded into a paste with the decoction of the roots of *Croton polyandrum*. Pills are made of the weight of 1 rattī. The vehicle used is a little water in which sugar has been dissolved. This medicine cures acute fevers. (II., 89.)

G. The ingredients of the medicine called Sri Sannipatamrityunjaya-rasa are as follows: mercury, sulphur, aconite, dry ginger, *Piper longum*, black pepper, the seeds of *Mucuna pruriens*, the roots of *Achyranthes aspera*, the roots of *Plumbago zeylanica*, the seeds of *Croton tiglium* and the bile of the rahu fish, the peacock, the goat, the boar, and the buffalo, are taken in equal measures and pounded together with the urine of the goat. Pills are then formed of the size of peas. (II., 118, 119.)

The above is said to cure Sannipata fever.

H. The ingredients of medicine called Churamani-rasa and Rasasindura are corals, gold, silver, tin, copper,

pearls, iron and mica. Equal measures of these are taken and pounded together with water. Pills are then formed of 2 rattis each. This medicine cures all kinds of fever that have affected the dhatus, intermittent fevers, fevers born of all the faults, as also cough, asthma, pains all over the body, headache, otalgia, pains in the teeth, inflammation of the throat, urticaria, diseases of the grahani born of wind and bile, pains in the waist, loss of appetite, piles and gonorrhoea. (II., 133.)

I. The ingredients of *Nyagrodhadi Churna*, twenty-eight in number, are detailed:—

Pound them into a fine pulv. This pulv., mixed with honey, is licked. After the licking, the patient should drink the decoction or the infusion of the three myrobalans. This medicine cures all the twenty varieties of gonorrhoea, as also all kinds of strangury and retention of urine. It keeps the skin from pimples. (II., 472.)

J. The ingredients of Maha Lakshmilas are mica 8 tolas, sulphur and mercury, each 4 tolas, tin 2 tolas, silver 1 tola, svarnamakshika 1 tola, copper half a tola, camphor 4 tolas, nutmeg flower, nutmeg and the seeds of *Datura fastuosa*, each 2 tolas, and gold 1 tola. Pound all these together with the expressed juice of betel leaves, and form pills of 2 rattis each. Taken with the expressed juice of betel leaves or with any other vehicle that is fit, this medicine cures gonorrhoea, loss of semen, loss of turgescence of the generative organ, cough, inflammation of the schneiderian membrane, phthisis, acute rheumatism, urticaria, diseases of women, diseases of the throat, diseases of the nose, diseases of the eye, fever born of all the three faults excited together, all phlegm-born diseases, and all diseases born of the three faults excited together. When a man is dying, and his body has lost all heat, this medicine acts most beneficially. (II., 495.)

K. The ingredients of Kamadhenu are the pulvs. of purified sulphur, and ripe *Phyllanthus emblica*, each 5 palas. Macerate these seven times in each of the juices of the fruit of *Phyllanthus emblica* and the root of *Bombax malabaricum*. After this, pound them together, and mix them with 10 palas of sugar and honey. The proper dose is 4 mishis, to be taken with ghee and honey. After taking the medicine the patient should drink a little milk. This medicine imparts sexual power to even an octogenarian. (II., 496.)

L. The ingredients of Aswagandha Taila are the paste of *Physalis flexuosa*, *Asparagus racemosus*, *Aplotaxis auriculata*, *Nardotachys jatamansi*, and the fruit of *Solanum indicum*. Take equal measures of these and milk four times the measure of the paste. Boil with these sesame oil duly. This medicated oil, rubbed over the breast, promotes its full development, and rubbed over the male organ of generation enhances its turgidity. (II., 507.)

The ingredients of Tryushanadya Lauha are the three acids, the leaves of *Cannabis Indica*, *Piper chaba*, the roots of *Plumbago zeylanica*, Vit salt, Audbhid salt, the seeds of *Serratula anthelmintica*, Saindhava salt, and Sachala salt. Take equal measures of these and add to it the ashes of iron equal to the united measure of the drugs named. Mix all these together. The measure of a dose is 4 rattis, to be taken with ghee and honey. This medicine cures obesity, gonorrhoea, and other diseases. (II., 510.)

Naturally one regrets that the other diseases are not detailed.

M. Fatty tumours may be cured by applying over them plasters made of the following, viz., *Curcuma longa*, *Symplocos racemosa*, red sandal-wood, domestic soot, and realgar, pounded in equal measures with honey. The same treatment should be adopted in the case of

open bleeding cancers. Plasters should be applied over tumours, made of beans, dry paste of mustard seeds, the seeds of *Dolichos biflorus*, and a large measure of animal flesh, pounded together with curds. The plaster should be kept long. When it is seen that worms have been generated and flies are breeding in it and that a portion of the tumour has been eaten away by them, the plaster should then be washed off, and the remaining portion of the tumour should be removed by surgical operation and its base cauterised by fire. The cauterised base should be covered with a thin leaf of lead, or copper, or iron. Alkaline ashes, fire and surgical operation, should be resorted to for completely removing the growth. The strength of the patient should be examined before surgical operation is resorted to. (II., 537.)

N. The ingredients of Goji Taila are sesame oil 4 seers, the paste of *Elephantopus scaber*, *Embelia ribes*, liquorice, the bark of *Cardamomum zeylanicum*, cardamom seeds, the leaves of *Cardamomum tamila*, the flowers of *Mesua ferrea*, camphor, the fruit of Kakoli, *Aquilaria agallocha*, saffron, and cloves, in all 1 seer, and water 16 seers. Boil all these together duly. This oil cures syphilis. (II., 553.)

The method of preparation of *Rasamanikya* is as follows :

O. Take a quantity of orpiment called Vansapatra, and macerate it, three or seven times in the juice of *Cucurbita pepo*, and sour curds. After maceration, divide the orpiment into small pieces. Keep the pieces in a concave earthen dish. Place another earthen dish upon it with the convex side upwards, forming the two dishes into a sort of sphere. Then lute the joining line with the paste of jujube leaves, and place the joined dishes on the mouth of an empty earthen vessel, and apply heat to it. When the vessel becomes red-hot, take down the joined dishes containing the orpiment. Upon breaking the vessel, the pieces of orpiment will look like shining pearls. The measure of a dose is 2 rattis, to be taken with ghee and honey. This medicine cures tubercular leprosy, those skin-diseases which are classed under leprosy, syphilis, fistula-in-ano and other ailments. (II., 561.)

P. The ingredients of Durlava-rasa are *Sida cordifolia*, *Sida alba*, *Piper longum*, Emblic myrobalans, *Elzocarpus ganitrus*, ghee and honey. Pound all these together with mercury, and rasa sindura, in a mortar and make pills of 1 rattis each. This medicine cures small-pox. It is named Durlava-rasa (unobtainable or rare) because it is really a rare medicine. (II., 588.)

Q. The ingredients of Indu Vati are silajatu, mica, and iron, each one part, and svarnamakshika, a fourth part. Macerate all these in the expressed juice of *Solanum nigrum*, *Asparagus racemosus*, the fruit of *Phyllanthus emblica*, and lotus flowers, and make pills of 2 rattis each. Taken with the juice of emblic myrobalans or their decoction, this medicine cures wind-born diseases of the ears, such as subjective noises, etc., as also gonorrhœa. (II., 605.)

R. The ingredients of Nagarjuna-Anjana are the three myrobalans, the three acrids, Saindhava salt, liquorice, sulphate of copper, galena, the fragrant wood called Pundaria, *Embelia ribes*, *Symplocos racemosa*, and copper. These four and ten articles are pounded into a paste with dew collected in the morning. Make sticks of this paste and apply as collyrium by rubbing them with human milk. It cures cataract; used as collyrium by rubbing them with the expressed juice of the flowers of *Butea frondosa*, they cure white spots on the cornea; and used as collyrium by rubbing them with goat's urine, they prevent the appearance of cataract. (II., 615.)

S. The ingredients of Chandragru-rasa are equal measures of mercury, sulphur, mica, iron, and tin.

Pound these together with the expressed juice of *Aloe indica*, and form pills of 2 rattis each. This medicine, taken with the decoction of cumin seed as the vehicle, cures all faults of the fœtus, piercing pains in the female organ, itching of the same, nymphomania, distension of the female organ, and other ailments. (II., 632.)

T. The ingredients of Soma Ghrita are vaccine ghee, four seers, and the paste of white mustard seed, *Acorus calamus*, the potherb called *Gratiola Monnieria*, *Plandera decussata*, *Boerhaavia diffusa*, Kshirakakoli, *Aplotaxis auriculata*, liquorice, *Picrorrhiza kurroa* grapes, the fruit of *Gmelina arborea*, the fruit of *Grewia asiatica*, *Ichnocarpus frutescens*, *Asclepias pseudosarsa*, *Curcuma longa*, *Cissampelos hernandifolia*, the bark of *Cinnamomum zeylanicum*, *Pinus deodara*, Sachala salt, *Rubia Munjista*, the three myrobalans, *Aglais Roeburghiana*, the followers of *Justicia adhatoda*, and red ochre, in all one seer. This ghee should be taken from the second month of gestation to the sixth month. It cures all faults of conception and the fœtus, as also of the female organ. It enables a woman to obtain a male child possessed of strength and energy. It clears the voice, removing all kinds of obstruction of speech. It cures dumbness. If taken for only seven days, one's memory is so strengthened as to enable one to reproduce a passage recited only once in one's hearing. (II., 639.)

U. The ingredients of Sahacharadi are the roots of *Barleria cristata*, tubers of *Cyperus rotundus*, *Tinospora cordifolia*, *Pederia latida*, dry ginger, and *Pavonia odorata*. The decoction of these should be drunk after mixing a proper quantity of honey. It cures puerperal fever and its pains on the very first day of its administration. (II., 645.)

V. The ingredients of Panchajiraka Gura are treacle 12½ seers, ghee 4 seers, and milk 8 seers. Boil all these together. When the mass assumes consistency, add to it pulvs. of *Nigella sativa* of the smaller variety, Habusha, coriander seeds, dill seeds, Vadari, *Ptychotis asofan*, *Sinapis racemosa*, Vansapatra (that variety of asafœtida which is called Nadi lingu) *Piper longum*, the roots of *Piper longum*, *Cassia sophora*, *Cnidium diffusum*, mustard seeds, and *Plumbago zeylanica* and 4 palas of the pulvs. of each of the following, viz. *Scirpus kysoor*, dry ginger, *Aplotaxis auriculata*, and cumin seeds. Cook all these on a slow fire. This medicine cures all the twenty varieties of the diseases of the female organ, also consumption, asthma, fever, phthisis, malignant jaundice, and chlorosis. It removes difficulty of micturition, and foetid smell of the body. Besides it helps the growth of the bosoms of the women and makes their eyes as broad as lotus leaves. (II., 647.)

W. The medicines which prevent the untimely appearance of the marks of age, remove the marks when they appear, and also protect a person from attacks of disease, are called Rasayana. Rasayanas confer longevity, sharpen memory, improve intelligence and complexion, impart strength, make the voice sweet, and protect one from sudden attacks of disease. Water used as snuff at early dawn acts as a Rasayan. It cures inflammation of the schneiderian membrane causing loss of the sense of smell. It also alleviates hoarseness of voice, and bronchitis or cough. It strengthens the eye-sight. Water, drunk according to one's capacity before the rising of the sun, cures wind-born and bile-born diseases and confers longevity. Water, drunk at early dawn through the nose, yields more salutary results than if drunk through the mouth. These two ways of drinking water are called Ushapana (drinking at dawn). Such drinking is highly beneficial in diseases due to indigestion. (II., 661.)

X. Boil the flesh of sparrows in the meat-juice of partridges, the flesh of partridges in the meat-juice of

fowl; and the flesh of fowl in the meat-juice of the peacock, and the flesh of the peacock in the meat-juice of swans, separately. Then fry each separately in new ghee. Make each sour or sweet by adding some sour juice or sweet juice, and perfume each with such aromatics as cardamom seed, etc. Each of these preparations increases the semen, and imparts strength to the whole system. (II., 666.)

Unfortunately we have little space to spare, but we cannot refrain from quoting the following passages from the list of articles of animal origin used in Ayurvedic therapy.

Jalasukti—Jhinuk—*Oyster*.—It is a kind of aquatic animal. Its flesh is acrid, demulcent, stomachic, digestive, cardiac, generative of the inclination for food and beneficial in abdominal tumours, Sula and diseases of poison. (III., 861.)

Makara—Makar—*Hind., Mang. (Garial)*.—It is a kind of aquatic animal found in rivers and seas. Its flesh is generative of the inclination for food, stomachic, generative of the secretion of semen, alleviative of wind, and stones in the bladder. (III., 863.)

Timi—Timi—*Whale*.—It is a kind of fish found in seas. Med. use.—It is sweet, stimulant, demulcent, heavy in digestion, costive, generative of the secretion of semen, inducive of dyspepsia, cardiac, phlegmatic and alleviative of wind. (III., 881.)

Now that we have brought to an end our study of the Ayurvedic system of medicine as set forth in the Charaka-Samhita, the Susruta-Samhita and the work of Kaviraj Nagendra Nath Sen Gupta, we are able to state the impressions received by us during the course of our study. The claim—made in a Calcutta print—that Ayurveda, since it has not changed for two thousand years, must be perfect, cannot be sustained by any one who will take the trouble to read the extracts given by us. It is idle to assert—as those who advocate Ayurveda assert—that the Sages used the words Vayu, Pitta, Kapha in a sense different from that attaching to wind, bile and phlegm, which these words signify to-day, because by these words they signified nervous force, metabolism, phagocytosis, and what not. Special pleading of this kind may do very well in the law courts, but it is entirely out of place in matters medical. It is not pleasing to find that the Kaviraj, in his account of the various diseases, vaunts his own preparations for their treatment. It is disappointing to find that the translator of the Charaka-Samhita, who professes to be able to identify the herb "Soma," does not say a word to indicate that he recognises the falsity of what is taught about its wonder-working virtues. It is strange that the Commentators, who must have had some power of observation and love of truth, countenanced, by their silence, the claims made for certain compounds, which were asserted to confer the power of renewing youth and prolonging life for hundreds of years, when taken according to the directions given.

In his preface the Kaviraj asserts that midwifery has made but little progress since the days of Susruta. This, we regret to say, is distinctly

a *suppressio veri*; for Susruta's midwifery consisted in enjoining the use of incantations alone to hasten the expulsion of the foetus, until its death. When the foetus was known to be dead, *then and then only* were the various manipulations described to be employed. To call this midwifery is an abuse of language.

A favourite contention brought forward by the protagonists of Ayurveda is that Anatomy and Surgery as taught by Susruta were on a very high level, and the assertion is often made by those who ought to know better that the method of dissection enjoined by him is superior to that followed all over the world to-day. To brush away, layer by layer, the semi-fluid tissues of a decomposing corpse is not the way to arrive at accurate knowledge of its structure. Otherwise how could the Sages for a moment have asserted that from the navel there run a great number of ducts, carrying Wind, Bile, and Phlegm; and how could their Commentators have dared to repeat the statement? No one has ever seen these ducts, but their description is there for all the world to read. It was with theories of the origin, progress and termination of disease, based on unstable foundations such as these, that the Ayurvedic system of medicine was built up.

As to Surgery, all that we need say is that if any one were to try to couch a cataract by following the directions given by Susruta, as to the instruments used and the manner of their use, he would assuredly cause damage to the patient. Susruta's surgery was that of his age—the Second Century, A.D.—and therefore very defective. It is idle to pretend that it was otherwise.

The respect paid to "authority" and the total neglect of easily-ascertainable facts, which could not but invalidate that authority, are the bane of this system. One of its corner-stones is the axiom that diseases are the results of the workings of malignant spirits, who must therefore be placated by offerings and cajoled by incantations. In the matter of children's diseases, it is asserted that these are due to the action of certain spirits, who were too late to secure lucrative appointments on the staff of the Destroyer, and were forced to accept power to levy toll on sorrowing parents, who might have committed any of the hundred odd ritual faults, by afflicting their offspring.

A system whose theories are ill-founded is bound to furnish glaring instances of the fact in its therapeutics. Thus we have in a *modern* work, a certain combination of drugs extolled as being able to cure such very different conditions as obesity and gonorrhoea; and another combination described as being able to effect a cure in *all* diseases of women, however caused.

A system which teaches that drugs and natural excretions, long since rejected by men in other

lands, should be used to-day in the treatment of disease can only be called antiquated.

A system which teaches that centipedes bite; that there are eight kinds of spiders whose bite is necessarily fatal; that the urine of a spider causes intense inflammation of the skin with which it is brought into contact; that the semen of the mouse is poisonous; that scorpions are generated by cow-dung and by dead snakes; and that to wear a myrobalan seed on the arm is a sure preventive of smallpox, cannot be said to be founded on accurate observation.

A system which teaches that the physician, *before he sees the patient*, can gather valuable information as to the outcome of the disease, from observing the complexion, dress, gait, and caste of the messenger sent to summon him, cannot be called scientific, even by the most sympathetic student.

A system which teaches that, for his own sake, the physician should refuse to treat a patient whom he deems to be in dire peril of his life does not accord with ethics.

THE BACTERIOLOGY OF THE BLOOD AND THE TREATMENT OF INFLUENZA OCCURRING EPIDEMICALLY IN CALCUTTA.

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CASES of influenza admitted into the wards of one of us in the Campbell Hospital from October, 1918, up to the middle of December, 1918, numbered 374. The blood of the patients for making cultures was taken by one of us, to whose wards the cases belonged, from the veins at the bend of the elbows, and two to three c.c. were immediately put into broth and agar tubes for culture. In ten cases the blood was taken from the heart under perfectly aseptic conditions within half to one hour after death.

The number of cases whose blood was taken for culture amounted to 90. The cases were clinically divided under two heads: (1) Mild cases in whom no pneumonic symptoms were present, and (2) cases in whom pneumonic symptoms were present and which were regarded as severe cases.

The results of blood culture of these two types of cases were very characteristic. Thus, out of 14 mild cases whose blood was taken for culture, only one shewed the presence of streptococci in the blood, and this case subsequently

developed pneumonic symptoms and died. On the other hand, out of 76 severe cases, 36 shewed the presence of streptococci or pneumococci in the blood.

The blood cultures in positive cases generally shewed the presence of streptococci or pneumococci. In two, there was pure culture of staphylococcus aureus obtained. In two Gram-negative, capsulated cocci which formed no growth on agar or subculture were obtained. In four, bacilli somewhat resembling typhoid bacilli, but Gram-positive, were obtained.

Summarizing the results of the blood examination, we have as follows:—

Out of 90 cases—

- 23 shewed streptococcal infection of the blood.
- 14 shewed pneumococcal do do.
- 2 shewed the presence of pure culture of staphylococcus aureus.
- 2 shewed the presence of capsulated Gram-negative cocci.
- 4 shewed the presence of a Gram-positive motile bacillus somewhat resembling typhoid bacillus.

It will thus be seen that the micro-organisms most commonly present in the blood were either pneumococci or streptococci.

Pneumococci ...	... 16 per cent. nearly.
Streptococci ...	... 26 " "

Leaving the mild cases out of consideration we have pneumococci present in 18 per cent., and streptococci in 27 per cent., of the severe cases. The mild cases shewed no bacterial infection of the blood.

The streptococci found could be distinguished as follows:—

- (1) Markedly hæmolytic ... 13
- (2) Slightly hæmolytic ... 2
- (3) Practically non-hæmolytic ... 8

In some streptococcus brevis was found. In most of the cases streptococci longi were found.

In 10 cases of the pneumonic type of the disease, cultures were made from the blood of the heart soon after death with the following results:—

- (1) One shewed pneumococci.
- (2) Three shewed streptococci without hæmolytic properties.
- (3) One shewed a hæmolytic streptococcus.
- (4) One shewed the presence of a Gram-positive motile bacillus otherwise resembling typhoid.

SEROLOGICAL TESTS.

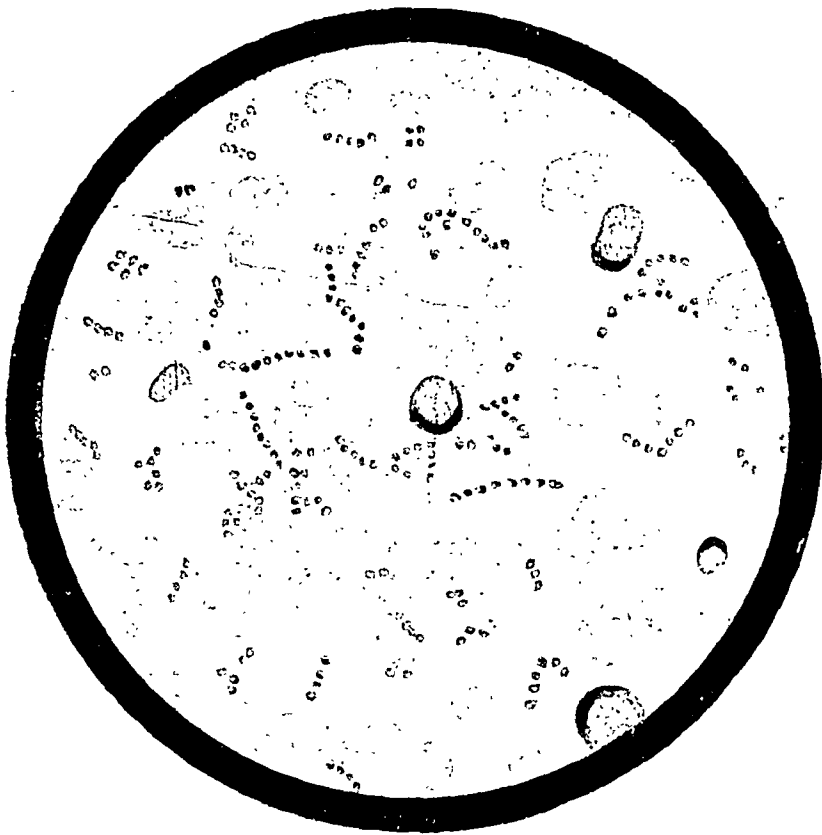
We have done a limited number of agglutination tests with the strains of streptococci obtained, and also with the anomalous type of bacilli above described, and the following results were obtained:—

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Streptococci in the spleen of the inoculated guinea-pig

TO THE HONORABLE MEMBERS OF THE HOUSE OF REPRESENTATIVES
AND THE SENATE OF THE UNITED STATES

IN SENATE,
January 10, 1901.
REPORT
OF THE
COMMISSIONER OF THE GENERAL LAND OFFICE
ON THE
LANDS BELONGING TO THE UNITED STATES

WASHINGTON: GOVERNMENT PRINTING OFFICE: 1901.

Case No.	Result of blood culture.	Agglutination test.	Nature of case clinically.
63	No growth	... No clumping with any strain of streptococci obtained.	Mild case.
80	Do.	... Do.	Do.
82	Do.	... Do.	Severe case.
84	Do.	... Do.	Mild case.
60	The motile Gram-positive bacilli.	One strain of streptococci showed clumping (1 in 2), partial (1 in 40). The bacilli showed clumping (1 in 40).	Severe case.
71	Streptococci	... The strain of streptococci obtained showed clumping (1 in 40).	Do.
75	Do.	... Do.	Do.
76	Do.	... Clumping (1 in 20).	.....
81	Pneumococci	... No clumping with any streptococci obtained. Clumped with the Gram positive bacilli (1 in 20).	Severe case.
83	Do.	... Do.	Do.

INOCULATION EXPERIMENTS.

A 24 hours' culture of one of the strains of streptococci with hæmolytic properties, obtained from the blood of one of the patients, was injected subcutaneously into one of the two guinea-pigs kept inside the same cage. The inoculated guinea-pig died after 60 hours. Smears were made of the spleen, the heart blood, and the lungs. In every one of these the same kind of streptococci was obtained as that with which the guinea-pig was inoculated. The accompanying diagram was obtained from a smear of the spleen of the inoculated guinea-pig. The second guinea-pig seems to have also been infected by contact (?) with the inoculated one. The second died 3 days after the death of the inoculated one, and the same strain of streptococci was obtained in the organs as in the inoculated one. Further experiments are being made to determine the infectivity of this strain of streptococci. A portion of this paper was read before the Calcutta Medical Club in December, 1918.

TREATMENT.

Remarks by Dr. Brahmachari:—

Before discussing the treatment of influenza I adopted in my wards, it would be interesting to study the prognosis of this disease as determined from the statistics of admissions and deaths.

Taking all the admissions into account, there were 141 deaths out of 374, *i.e.*, 37 per cent., nearly. Leaving the cases that died within 24 hours, the death-rate was nearly 25 per cent. There was no death among the mild or non-pneumonic cases. The death-rate among the pneumonic cases was nearly 67 per cent. Leaving the cases that died within 24 hours after admission, and those that were treated with the special treatments to be subsequently mentioned, the percentage of death-rate among the remaining 85 cases was nearly 82 per cent.,—an appalling

figure when compared with the death-rate of pneumonic cases admitted into my ward in former years. Thus, some years ago I collected the statistics of death-rate of cases of lobar pneumonia, admitted into my wards in the Campbell Hospital, and it was found that the death-rate was only 26 per cent. We thus conclude:—

- (1) Recovery among ordinary cases of lobar pneumonia ... 74 per cent.
- (2) Recovery among cases of influenza complicated with pneumonia ... 18 per cent.

These are appalling figures and any medications that would reduce this terrible death-rate must be of the greatest value.

Various drugs were tried by me, some of which I shall mention very briefly. These include mercury in the form of electro-mercuriol, silver in the form of electro-argol, colloidal manganese, and stannoxyl. None of the drugs seems to have influenced the course of the disease.

Among the treatments that seem to have influenced the course of the disease in the severe cases are the following:—

- (1) Vaccines.
- (2) Colloidal iodine.
- (3) Formaldehyde-sodium-disulphite.

1. Vaccines:—

Forty cases were treated with injections of combined catarrhal vaccine of P. D. & Co. Half c.c. was injected at the first dose, and another half on the 4th or 5th day. Leaving the mild cases included among these, the percentage of death-rate was nearly fifty per cent.

Cases which showed pneumococci in the blood were treated with the combined pneumococcus vaccine of P. D. & Co. A few cases were treated with anti-streptococcic serum. The number of cases treated with these were not sufficient enough to justify any conclusions. A vaccine from the different strains of streptococci obtained from the heart and the veins has been prepared and used in a few cases.

2. Treatment with intravenous injection of iodine:—

I have used colloidal iodine in the form of collosol iodine of Crooks & Co. (1 in 500.) Doses of 10 c.c. to 30 c.c. have been given intravenously. This would be equivalent to 1/3 to 1 grain of pure iodine. No untoward results followed these intravenous injections. The injections were given once a day. Altogether 5 to 6 injections were given in each case. The results seem to be satisfactory. Thus, out of 21 severe cases of influenza with pneumonic symptoms, 8 died, giving a percentage of recovery in 62 per cent. of the cases. This compares very favourably with the death-rate of 82 per cent. among the untreated cases.

3. *Formaldehyde-sodium-disulphite*:—

Fifty to 100 c.c. of 1 in 1,000 solution, in normal saline, were given intravenously in a series of 19 cases of pneumonia after influenza. The number of injections ranged from 3 to 5, being given once a day or sometimes on alternate days. Six out of 19 cases died, giving a percentage of recovery of 68 per cent. of the cases.

I append here the notes of one of the worst cases of influenza pneumonia, apparently cured by intravenous injection of colloidal iodine.

Patient, aet. 65, developed broncho-pneumonia after influenza. For a few days her condition was almost desperate, the pulse being kept up by injection of strychnine and digitalin and caffeine-sodæ-benzoas. There was an extensive patch in the base of the right lung. There were patches of broncho-pneumonia in the left lung. The patient was given 6 injections of colloidal iodine and recovered.

I am deeply indebted to Colonel Leventon, I.M.S., Superintendent, Campbell Medical School, for giving me every facility in carrying on my researches, and to Dr. Surendra Nath Ghosh, Bacteriologist, Presidency General Hospital, for the valuable help he has given me in the bacteriological portion of this investigation. In our opinion, whatever may be the part played by the influenza bacillus in the etiology of this disease, the high death-rate is due to a streptococcic and perhaps pneumococcic infection.

RAILWAY TRAVELLING IN HOT WEATHER.

By F. N. BOSE,

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Preface.—Various means to minimize the discomfort of hot-weather travelling have been adopted and tried by different railways in India at different times, but none, so far, has proved to be of much value or of real comfort to the passengers. The methods adopted, probably, have had no scientific basis, but were introduced upon mere suggestions and recommendations put forward from time to time. Of course it is a very big problem to solve, and I doubt if it could ever be solved to absolute perfection. India is a vast country and some of the railways are very long, passing through various provinces, each with a different atmosphere of its own, resulting in constant changes in the weather as a train passes through the different parts of the country. Moreover, the expensive means adopted by a business concern to secure the comfort of upper class passengers can hardly be expected to be applied in the case of lower class passengers; who pay less fare, and whose habits would render these measures distinctly objectionable if applied to them. So the comfort of the two classes have

to be considered separately. By upper class, I mean first and second class; and by lower class, intermediate and third class passengers.

Experiments.—Certain recent experiments made on this subject may be here described:—

(1) While an ambulance train was passing through the Sind Desert in the middle of August, 1916, certain experiments were carried out by Captain Nicholson, I.M.S., medical officer in charge of the train, to ascertain the efficiency of some methods generally suggested to lower the temperature of a railway carriage running in hot-weather months. His experiments consisted of the following:—

Four ward cars were selected for the purpose. These were ordinary third class N.-W. Railway bogie carriages, modified according to requirements, fitted with upper and lower berths, running lengthways down the carriages for 24 invalids, having bath-room and lavatory and a sink-room at alternative ends. Each car had six electric fans, all working from the roof.

In the first car three sheets were hung close under the fans and were kept saturated with water all day. In the second car two one-maund blocks of ice were kept standing all day in the centre of the car. The third car was used as a control, and the fourth car, at every convenient halt, had its roof and sides well soused with water.

The temperature recorded, every two hours, of each car was as follows:—

Time.	No. I Car.	No. II Car.	No. III Car.	No. IV Car.	Remarks.
					<i>Nil.</i>
9 A.M. ...	92°	92°	92°	92°	..
11 " ...	97.8°	98°	98°	98.1°	..
1 P.M. ...	100.1°	100.1°	101°	100.1°	..
3 " ...	101.5°	102°	102°	101.5°	..
5 " ...	102.5°	102.5°	101°	102.1°	..

From the above it, will be noticed that none of the methods just described could bring on any perceptible change towards reduction of temperature; moreover, every method had its drawback. The first method was resented by the occupants, these saying that the sheets kept the breeze of the fans from off them. The second method was certainly messy, and expensive as well, and the third is not always possible, except at big junction stations, which are few and far between.

(2) The following experiments were carried out by me, towards the end of August (29th), 1917, in an exceptionally hot and close afternoon. The train selected was a fast passenger, running at an average speed of 25 miles per hour.

An ordinary type of first and second class composite bogie carriage (E. I. R.) was selected, these having second class compartments at each end and two first class in the middle. The marked carrying capacity of the second class was 12, and that of the first class 6. The second class

compartments had one electric fan each, and the first class two, all working from the roof.

Into each of these four compartments two thermometers were hung up: one in the centre of the wooden partition wall at the engine end and the other into the gap between the second and third windows. The windows of the first compartment (a second class), both sides, were all covered with *khus-khus* purdahs and kept *in situ*—only the door windows were left open, water being periodically dashed through the purdahs, which were kept constantly wet. The second compartment, a first class, the windows of which like the first were covered with wet sheets and kept constantly wet. The third compartment, also a first class, at the windows of which 3½ seers of ice each (20 seers divided into 6 pieces) were placed on each window. The fourth compartment, a second class, was used as a control. The temperature recorded was as follows:—

access of air, which in itself is a very cooling agent. By this I do not mean the hot and scorching wind one gets blown into the carriages during the day, while passing through the United Provinces, the Punjab, etc.,—but this even is very pleasant and gratifying while one is perspiring. It would therefore be a great advantage and comfort if all the passenger vehicles are made of the bogie type, and the 4-wheeler type be abolished. One great advantage the 4-wheeler had was the sunshades, though they were faulty to a great extent. The bogie coaches being devoid of sunshades, the rays of the sun beat directly inside the carriages, both at sunrise and sunset, which made the occupants very uncomfortable. Moreover, the direct rays of the sun plays a big rôle in irritating the thermogenetic centre of the human body, and by itself is enough to cause very serious ailments in mankind, such as sun-stroke, etc. So direct rays of the sun must always be avoided.

Time.	COMPT. I		COMPT. II.		COMPT. III.		COMPT. IV.		REMARKS.
	Window.	Wall.	Window.	Wall.	Window.	Wall.	Window.	Wall	
15 hours ..	97° 5'	97° °	97° 5'	97° 5'	97° 5'	97° 5'	97° 5'	97° 5'	Before experiment.
15—30 ..	96° 4'	97° 2'	97° 2'	97° 5'	97° 4'	97° 5'	97° 5'	97° 5'	
16—30 ..	92° 8'	94° 6'	96° 6'	97° 2'	97° (?)	97° 2'	97° 2'	97° 2'	* Fluctuating.
17—30 ..	91° 6'	93° 4'	92° 6'	93° 2'	93° 4'†	93° 4'	93° 4'	93° 4'	† Ice all melted.
18—30 ..	91° 6'	92° 6'	92° 4'	92° 8'	93°	93°	93°	93°	

From the above, it will be seen that none of the above methods could reduce the temperature to even 1 degree in any case, except in the case of No. 1 compartment with *khus-khus* purdahs, and that near the windows only, when on one occasion the temperature was reduced by 4½ degrees nearly. As regards the reduction of temperature, there is nothing much to speak of; but certainly the cool breeze coming through the *khus-khus* purdahs, while the train was in motion, was very pleasant and gratifying, and more so for the occupants of the side benches. During big halts at stations, when there was no current of breeze passing through the purdahs, it was a bit stuffy, though the thermometers did not record any rise of temperature. No. 2 compartment, with wet sheets, was not very satisfactory. The occupants resented it, as it kept the breeze off, probably due to the close and dense meshes of the sheets. The little breeze that was coming through was nice, cool and pleasant. Some sort of cloth with wider meshes might have worked better. No. 3 compartment, with blocks of ice, was quite useless, though the breeze straight from the ice was quite nice and cool.

Construction of the Carriages.—It is an admitted fact that the bogie carriages are far more comfortable than the old pattern 4-wheelers with small partitions and seats running breadthways. Moreover, the bogie carriages have a number of big windows and so there is more

The only means to avoid the direct rays of the sun in the bogie carriages at present is to put the *jhilmilies* up on the sunny side but that stops access of air. To overcome this difficulty, the windows of the bogie carriages should be provided with sunshades.

Fans.—The present system of fitting up the upper class carriages with one or two small electric fans is of no practical value. In some cases they are so fitted that their position cannot be changed, and breeze thrown out from such a fan is almost always lost and does not reach the occupants of the benches. For those whose position can be changed, the breeze is just enough for one person only, sitting right across it. These fans should be of long blades, enough to throw breeze all over the compartment, and sufficient in number, at least two in each compartment. Ordinary *punkhas* with poles and frills hung up lengthways of the bogie carriage, up to the end of the benches, two in each compartment and worked by electricity, would, I think, work ever so much better than the present fans—as they have in the Military Barracks, Bareilly.

The outer sides and ends of the body of the carriages are generally made of iron sheets. These sheets get heated very quickly to a great extent and materially increase the temperature of a carriage. To minimize this, I would suggest that some non-conducting

material be used in between the outer iron and the inner wood, *e.g.*, felt, asbestos, etc., or the iron sheets be replaced by woodwork only.

Colour.—The present system of painting the carriages with a chocolate or dark brown colour, etc., is bad, so far as the heat is concerned. With the framework of the body of the carriages painted such a colour, there is a continual absorption of the heat of the sun, and that is the reason why one feels much more uncomfortable towards evening. In such a case the heat is also retained for a considerable length of time. To avoid this, the carriages should be painted with a colour which will throw off the heat, rather than absorb it. For this purpose white paint is the best. I find, however, that now-a-days painting the carriages white is being gradually done away with. I presume it is due to the fact that white paint gets dirty quickly and the carriages require repainting often. If the cost of painting and repainting all the carriages white be prohibitive, only the upper class carriages could be painted white.

Glare.—The glare of the tropical sun is very severe and a strong irritant to the central nervous system of the human body, and is carried to it by the optic nerve (eye). Irritation to the nervous system is followed by severe exhaustion, if continued to a certain length of time, resulting in severe discomfort. If the glare be avoided, one feels the heat very much less than otherwise. To overcome this difficulty, coloured or tinted (smoked) panes of glass should be introduced, instead of white ones as used at present. For this purpose, light green or ashy gray-coloured glass is the best.

Khus-khus tatties or purdahs.—Only a few years ago some of the upper class carriages were seen fitted with “*khus-khus* coolers,” as they were called, on one or two windows on each side of a compartment. These have been done away with now. I cannot say why, but I presume they were found to be useless, as there was the difficulty of keeping them constantly saturated with water, in which case they are not only useless, but cause discomfort by keeping the breeze off the windows. Moreover, on account of the faulty mechanism of the water reservoirs of the *tatties* beneath the windows, water used to leak out, causing destruction of the painting below. I think they are a great comfort for hot weather, so long as there is a plentiful, rapid current of air to pass through them, and of which there is always a good natural supply as long as the train is moving, and if they can be kept constantly wet. My experiment, as mentioned above, goes to prove that they actually reduce the temperature of a carriage to a certain extent, though not much, but certainly to some extent ($4\frac{1}{2}$ degrees) close to the windows. At any rate the cool breeze coming through the wet *purdahs* was

distinctly pleasant. It may be argued that it may cause the inside atmosphere of the carriage, to be saturated with water, resulting in discomfort by lessening the evaporation of the body sweat, but the discomfort will be practically “nil” as long as there is a constant supply of a current of air from outside, cooled down before getting in, and which again is kept in constant motion by the fans inside. Moreover, the comparative slow evaporation of the sweat, if there be any, will keep the skin moist and cool. I admit there will probably be some discomfort felt at big halts, when the train is standing at a station, and when there will be no rush of breeze from outside through the *tatties*. But arrangements should be made so that these *tatties* may be easily put up or put down at the pleasure of the occupants, in the same way as glass panes or *jhimilies* of a window, and so this difficulty will be removed. I would suggest that the present iron-gauze shutters be replaced by thin *khus-khus tatties*. Provision should also be made for automatic saturation of the whole of the *khus-khus tatties* with water all the time by means of a linear shower-bath, running between the outer and inner wall of the windows, at a level little below where the vacuum chain pipe runs, and a receptacle to hold and drain off the surplus water at the bottom. According to the old principle, the occupants were to revolve the *tatties* to keep it wet. I think this is too much to expect from a first class passenger; he or she would do without it rather than keep it revolving. The result was that the *tatties* kept the natural breeze off, so the idea of having the *tatties* was objected to and gradually fell into disuse. *Khus-khus tatties*, again, require periodical changing, as after being in use for some time, they not only lose power as coolers, but also lose their nice and refreshing aroma. I would suggest their renewal every $3\frac{1}{2}$ months, *i.e.*, to be renewed once only after being put up at the beginning of the season. All the windows of a compartment should be covered with *tatties*, probably the door-window alone excepted.

Accommodation.—In compliance with the Indian Railway Act, the carrying capacity of every compartment is exhibited inside the carriages. This carrying capacity is fixed and applicable for all weathers,—summer, winter and rain. I presume this is the maximum carrying capacity possible. I have measured the lengths of the benches of the various types of carriages that are in use, and have found out that the average amount of space allotted for each passenger, as compared with the number of seats marked out, falls a little under 24 inches. This may be all right for the cold weather, but is most decidedly quite inadequate for hot weather travelling in India. Moreover, where the intermediate space between the benches is narrow, as that of a third

class carriage, the discomfort is more marked. Above all, when the carriages are over-packed, as it generally happens in the case of lower class of passengers, it is simply miserable and suffocating. The railway servants very seldom pay any heed when overcrowding is brought to their notice, which, as a matter of fact, they themselves are expected not to allow, but to clear off the traffic they generally put in more passengers than the allotted seats. The result is that these keep standing for want of sitting accommodation, thus stopping the free ventilation of air. I should say that such an act is criminal if done during the hot weather months. All cases of overcrowding, or encouragement to do so, must be stopped, and the railway servant through whose neglect or encouragement such things happen must always be very severely dealt with. Moreover, there should be two distinct carrying capacities exhibited for summer and winter, the former from April to October, and the latter from November to March. I suggest that at least the marked out present military capacity be introduced as the public carrying capacity for hot weather months, if it cannot be reduced further.

Speed.—The speed of the trains, especially of the through passenger trains during hot weather months, and more so during the day-time, should be accelerated to its maximum, with the least number of halts possible, as the longer the hours spent in the journey during hot months, the more discomfort one feels. More night trains should be introduced for comparative longer journeys than the day trains. The day trains should be meant for small journeys and local workings. Acceleration of speed in my opinion is the best of all methods, and I would lay great stress on it.

Water-supply.—The present system of drinking water supply by the Hindoo watermen and *bhisties* is quite inadequate. The authorized halts at roadside stations are very limited (2 to 3 minutes only), not enough to serve water to more than half a dozen passengers at the most in the way the work is carried out now. This even is possible only if the watermen are ready with their water, which is very seldom the case, and give up their lazy way of walking and carrying out their duties in general. These watermen, again, are taken away from their legitimate duties and worked as porters if any member of that class happen to be off sick or otherwise absent. The station-masters, who are generally more anxious to finish their loading and unloading work during the limited time of halt, to avoid detention of the train (which is taken up more seriously by the officers of the Traffic Department, rather than the drinking water supply to the passengers), try to get as much labour as possible and fall back on the watermen. Many a time have I noticed the waterman throwing his bucket aside and running

with the caution signal book to the driver and the guard of the train to obtain their signatures. The result is that there is a cry for water from the passengers. It is needless to say that the quality of water supplied for drinking purposes must be very good too, but I have very seldom seen it anywhere near wholesome. The buckets or *gharras* are left open, generally under a tree, where dry leaves, and droppings of birds fall into them, while passengers, who happen to be on the platform some time before the arrival of the train, dip their dirty *lotas* into the buckets. Educated Europeans and Indians, who understand the danger of drinking polluted water, refrain from drinking such water,—rather are forced to do without it. I have tried many a time to impress on the Indian station-masters the vital necessity and importance of supplying wholesome drinking water to the passenger public, but regret to say I could never make them understand the gravity of it. The supply of drinking water must be quite plentiful and wholesome, and as long as it is left in the hands of such irresponsible men, I am afraid matters will never improve. The work must be taken away from their hands and put under some such person who understands its importance. To overcome these difficulties I would suggest the following:—Let one third class compartment of a bogie carriage be converted into "Water-compartment." One end of this compartment be fitted with a galvanized iron tank, having a capacity to hold three-hundred gallons of water, which will occupy about forty-eight c.ft. of space—provided with two waste-not-taps projecting outside the compartment, on both sides, at convenient heights, so that the water may be drawn from a high as well as a low platform, with the notice "Pure Drinking Water—Free," in English as well as in the vernacular of the province. There should be another tap inside the carriage also. The tank may be filled in either from the top or from the sides, preferably from the top, and kept locked up till filling or cleaning of the tank is required. The other end of the same compartment to be fitted with pigeon-holes or shelves to hold aerated water bottles and an ice-box. The compartment should be painted with a conspicuous colour, say green or blue, and the carriage having this compartment should invariably be put in the centre of the train, so that the passengers from both ends of the train will have quick and easy access to it. There should be allowed only two men in this compartment, *viz.*, one aerated water and ice vendor, and the other a railway Hindoo waterman, provided with a clean bucket and a *lota*, who should fill in his bucket from the tap inside the station at every halt, and travel from compartment to compartment to serve out water, in addition to those who can help themselves by fetching water from the "Water-compartment."

At big junction stations arrangements should be made for the tank to be filled with pure and refined water, under the supervision of some responsible officer, preferably an intelligent European subordinate. This method, I am sure, will be cheaper in the long run, as it will save the cost of maintaining so many *paniwallas* and *bhisties* at stations, and in all respects will be more efficient than the present one. An ordinary passenger train is hardly longer than one consisting of twelve bogie carriages (equivalent to thirty 4-wheelers) and with an average accommodation of about 1,200 passengers. If two pints of water per head is allowed, on the average, for the journey from one junction station to another, covering an average run of about 6 hours, I think it will be quite sufficient to have a tank holding 300 gallons, which will be able to supply one gallon per head per 24 hours,—a fair supply for drinking purposes.

Bath-room.—The supply of bath-room water should also be clean and plentiful. It would be a great comfort to the upper class of passengers if a nice little bath were supplied to all the lavatories connected with the upper class carriages, for after all nothing is so refreshing in the hot weather as a nice cold bath, and it is bound to mitigate a good deal of discomfort.

Sale of hot weather commodities.—At stations vendors should be encouraged to sell a cheap class of hand *punkhas*. At small stations, where no vendors are forthcoming, the undertaking may leave some cheap *punkhas* for sale with the station-masters, to sell in the same way as they sell the railway time table, guide, etc. This would be a great boon to the passenger public—and also a source of profit to the railway.

The present system of vending ice and aerated waters is not very satisfactory. The prices of both are very high, more than double as compared with current market prices. Ice by itself can seldom be had, as the vendors keep a very limited stock, just enough to put a small bit in the aerated waters. The prices of ice and the aerated waters should be reduced to their minimum, so that it will be within the reach of everybody to buy them. The stock of ice should always be quite plentiful, and must be supplied whenever asked for.

CONCLUSIONS.

(1) All coaching vehicles should be of bogie type and provided with sunshades.

(2) The number fans to be increased, and they should be of bigger blades, or *punkhas* with poles and frills, and worked by electricity, could be introduced.

(3) The outer iron sheets of the carriages to be replaced by wood-work.

(4) The upper class of carriages to be painted white on its outer side.

(5) The window-panes of carriages should be smoked-tinted, light green or ashy grey colour.

(6) The upper class of carriages should be fitted with *klus-klus tatties*, which can be put up or put down easily by the occupants, with an automatic saturation arrangement of the *tatties*.

(7) There should be two distinct carrying capacities marked out, for the hot and the cold weather respectively.

(8) Acceleration of speed of all through trains, with minimum number of halts possible.

(9) Introduction of "water-carriage" on all passenger trains.

(10) Supply of a bath in all the lavatories of the upper class of carriages.

(11) Engagement of vendors to sell hot-weather commodities, such as hand *punkhas*, etc.

(12) The price of ice and aerated waters must be brought down to the minimum, and the stock of ice for sale must be plentiful at all times.

REFERENCE: *Indian Medical Gazette*, October 1916.

ACIDOSIS IN RELATION TO DIABETES.

BY BAMANJI NAVROJI ANKLESARIA, B.Sc., L.M. & S.

MAY I venture to seek again the favour of a small space in the popular columns of your valued journal on a subject which has been earnestly engaging the attention of the profession all the world over?

That "Time is the greatest innovator" holds as true now as when Bacon wrote it. English physicians and pathologists are held as being rather late in the day for a discovery or research in the field of medicine. But to their credit be it remembered that they have always preferred to express their settled convictions rather than, like others, make statements to-day which they may have to alter to-morrow. More than half a century ago when Prout asserted that "diabetes always accompanied carbuncles, malignant boils or abscesses," his statement was marked as too sweeping. To-day few surgeons would deny the frequent association of this condition in septic cases; but whether septic organisms are responsible for the production of this condition has, till now, remained a matter for much thought and work. In my previous communications on this subject I have tried to show that the idea is not only a permissible but a probable one; and I have adduced evidence—surgical, clinical and bacteriological—in its favour. The following observations of O. Leyton from *B. M. J.*, of 24th February, 1917, lend further support to what I have already said:

"In several cases removal of infected teeth and treatment of gums without any modification in diet has led to the disappearance of even high percentages of sugar from the urine." (The italics are mine.)

If then the removal of oral sepsis would remove so much sugar from the urine, I shall hereinafter show that the oral condition is but a prelude to a grand tragedy to follow. It is after all—as will be seen from what follows—the result of a local acidosis which I would hasten to call "oral acidosis."

When the septic matter from the mouth enters the stomach with foodstuffs of unsuitable quality or excessive in quantity hastily swallowed, without proper mastication, it naturally in the course of time induces a condition of chronic catarrhal gastritis. The large dilution of gastric contents by post-prandial drinks or even large quantities of water deprives the gastric juice of its solvent, antiseptic and attenuating properties. The bacteria therefore continue to grow unmolested in the stomach and cause much fermentation and decomposition of foodstuffs. In other words, the normal digestion is gradually displaced by bacterial fermentation and the bacteria which entered the mouth as so many saprophytes have now, by adaptive changes, obtained the status of parasitic or quasi-pathogenic organisms.

The ill-prepared chyme meets with no better fate in the intestines where the bacterial activity, instead of being hampered, is greatly increased. In the ileal residue entering the large gut there is now an orgy of putrefactive bacteria giving rise to poisonous ptomaines and bacterial toxins, besides considerable quantities of indol and skatol derived from the protein residues.

Now let us for a moment pause and see what all this means to the system. It will be seen from the preceding account that we have an abnormal digestion in place of a normal one, and that we have, therefore, more of the side-products of such a faulty digestion in the alimentary canal. I am sorry lack of space prevents my dealing at length with the wide and difficult subject of metabolism in diabetes in this place; so without going deeper into the matter, I shall simply make mention of these side-products, leaving it to your readers to fill up the gaps to make up my meaning.

We have an excess of albumoses and proteoses from the maldigestion of proteins; we have toxic amines from amino-acids and poisonous bases of choline and neurine types from phospholipins and phosphoproteins; we have also ketonic acids produced from the members of the aliphatic series or their amino-derivatives. Furthermore, we have also the formation of other acids, e.g., lactic, uric, oxalic, and phosphoric to complete the picture of what may be termed "alimentary acidosis." To these

retrograde by-products of a perverted digestionⁿ we have to add those derived from the bacteria^a themselves. These are principally the different toxins and filterable viruses.

The vitiated and comparatively acid chyle has now to pass through the selective filter-bed of hepatic parenchyma where it is subjected to various changes by processes such as oxidation, reduction, amination, deamination, hydration, dehydration, carboxylation, etc., which have for their object to warehouse those materials which are fit for reserve purposes and distoxicate and eliminate others which are injurious. Under normal conditions of health the liver substance is quite potent to deal with the slightly tainted chyle, but with the increasing physiological sin of an irregular and intemperate life it begins to show signs of strain and fatigue by allowing through its substance the passage of noxious products of digestion and putrefaction into the general circulation. This state of affairs in the liver may be termed the "portal acidosis."

In this connection the more recent work of Murlin, Kramer and others may be found somewhat interesting. They have shown experimentally "that the mechanism regulating the level of the blood sugar is peculiarly sensitive to the disturbances in the acid-base equilibrium of the body, acid production leading to hyperglycemia, while alkalosis exerts an influence in the opposite direction."

While the liver is thus affected through the portal system, the pancreas is reached by the streptococci and their toxins by direct continuity of structure *via* Wirsung's duct, and its accessory, the Ductus santorini. Their early effect on this gland is to dislocate its function and later on to excite degenerative changes by their continuous irritation. This explains the fact that pancreas is found apparently healthy in early and mild cases of diabetes, whereas it is always found diseased in late and severe forms; and this statement is borne out by the frequent presence of streptococci in cases of chronic pancreatitis.

The result of this combined action on the liver and pancreas is a temporary or permanent abeyance of the glycogenic function of the liver and of the antagonistic action of the endocrinous pancreatic enzyme. Under this dual influence there occurs an increased glycogenolysis in the liver with a corresponding hyperglycemia and a relatively high grade of glycosuria.

The effect of the release of various toxic products from the portal into the systematic circulation is now felt by the endocrine glands and chiefly the spleen, thyroids, adrenals and pituitary, as also by the renal, muscular and nervous systems (systemic acidosis).

As early as 1903 Sajous had shown that bacterial toxins caused thyroid hyperplasia. Observations of McCarrison on the origin of

goitre have led him to believe that it is caused by water charged with faecal contaminations as also by food similarly tainted. Other observers in the field have also confirmed these findings. Bearing therefore in mind the rôle played by this and other cryptorhetic tissues in the body metabolism, one cannot escape the conclusion that is thus forced upon him that diabetes at any rate seems to be a low type of latent toxæmia.

I am sorry the consideration of space again proves a bar to my going at length into the subject, but I feel sure your intelligent readers can supplement this deficit by their own garnered knowledge.

We are now in sight of the worst of the worst phase in the development of boils and gangrene under the influence of some physical trauma. Thus a moist hot atmosphere gives rise to boils; and anyone of them scratched or otherwise irritated develops into a carbuncle. Even so slight an injury of the extremities, where distal circulation is languid from the effect of a circulating toxin on the cardiac musculature, results in the death of the injured part. Here for the first time clinicians generally see signs of acid intoxication in the form of diabetic coma. Undoubtedly the development of these terminal septic lesions would, according to Sir Almroth Wright's hypothesis, greatly aggravate the already existing acidosis; but let it be remembered that in these patients they are not essential for its onset, for diabetic coma may supervene any physical strain, *e.g.*, severe exercise, fast running, climbing uphill, going upstairs, exposure to heat and cold, or even after a debauch or a meal of rich or tainted food.

Now, with a few words about Sir A. Wright's hypothesis of acidosis as seen in cases of gas gangrene, I shall have finished with the task I set to in the beginning; I cannot do it better than by quoting the following passage from the *B. M. J.* of 13th January, 1917, page 53, appearing under the heading of "Pathology of Gas Gangrene." "Sir A. Wright considers that pending further investigations, it may perhaps be assumed that the production of acidosis proceeds, not only in the infected tissues in relation with the wound, but also in the liver and other internal organs to which the bacillus of Welch has been conveyed, its metastatic growth being favoured as soon as the alkalinity of the blood begins to be reduced by the influx of lymph charged with acid in the infected tissues." If in this passage we substitute streptococcic activity for that of *B. Welchii*, we can easily realize the part played by these organisms in the ruin of body metabolism and producing glycosuria, as also the subsequent redoubled action of these agencies in producing the coma of carbuncles and gangrene.

To sum up, then, we have in a case of diabetes a concealed morbid picture of an increasingly adaptive potentiality of the protean streptococci and their pyogenic associates.

Metaphorically these bacteria, which, like a set of bandits, enter the mouth as so many innocent immigrants soon succeed in obtaining the privilege of domiciles; and in course of time claim the right of permanent settlers. From here they enter into the vast territory of the alimentary canal, where their presence is not felt until they begin to play their part as mischief-makers to digestive processes. Their aggressive nature is further manifested in their encroachments on the pancreas and liver. They now present themselves as definite invaders of the already weakened system, whose final conquest they declare in the shape of boils, carbuncles, and gangrene, and thus betray their true hostile nature.

The foregoing account is only an expression of my personal conceptions of the diabetic condition as obtained from experiences of the past and findings of the present, and if they are yet deemed as innovations, I would only say that the hand of time has so wrought them and forced them upon me.

A Mirror of Hospital Practice.

TETANUS.

By A. NORONHA, M.D.,

Honorary Assistant Physician, J. J. Hospital, Bombay.

It was said by someone that we knew very little more about tetanus than what Hippocrates did. To a large extent this is true. The war has, however, served as a stimulus to its study, considering the toll exacted by the malady among our wounded. My line of inquiry at the J. J. Hospital has been directed towards the following points:—

- I. The value of anti-tetanic serum as a curative measure.
- II. The use of carbolic acid in the disease.
- III. The existence of clinical symptoms referable to the brain.
- IV. Trismus and its relation to the course of the disease.
- V. The degree of anæmia and its possible causation.

In a paper read in July last before the Bombay Branch of the British Medical Association, I have detailed the several observations made in connexion with this disease till 31st May, 1918. In the present communication I shall omit, as far as possible, all statistical details which will be given in due course before one of the Medical Societies of Bombay.

It is needless to point out that in civil practice the material is too scanty to allow of an exhaustive study. War conditions also do not allow of an adequate supply of anti-tetanic serum, so that one is forced back on mixed treatment, to be able to say that all has been done to the victims of this affection.

1. The value of anti-tetanic serum in the fully established disease is difficult of appreciation. There are some cases that look very mild at the outset, but which in a few hours show so grave an aspect that no amount of serum will save them. Other cases show severe signs at first but improve after the very first dose of antitoxin given intravenously. These cases invariably recover. Others remain stationary with frequent fluctuation in the symptoms. These have a chance of recovery, but may get worse and end fatally. This leads me to think that the course which the disease takes depends on various factors, the chief of which are the following:—

1. The virulence of the infection.
2. The amount of toxin absorbed by the nervous system.
3. The early involvement or otherwise of the vital centres.
4. The site and nature of the wound.

In considering these points one must first decide whether the cases that recover under serum treatment would recover without its use. To do this one has to fall back on figures. During the last one year I have had 66 admissions in my wards, and two cases have been treated in private practice. Some of the hospital cases came in so bad that they died before I had the opportunity of seeing them. For our present purpose these may be dismissed from our reckoning. This leaves us a balance of 55 and two other cases mentioned. Again out of these 57, 53 received serum treatment with a mortality of 28, which means 32·83 per cent. in serum cases as a whole, and 50 per cent. of the total hospital admissions, including every case that came into the ward. These figures compare very favourably with the past when serum was not used at all or when it was supplied in too small a quantity to be of much use (vide *Lancet*, December 22, 1917; for figures, see article by Cooper). Unless one considers this a *lucky series*, it is impossible to avoid the conclusion that serum has been instrumental in reducing the hospital mortality to some extent at least. At present I am using an average of 22,000 units for each case as a whole, a quantity that is recommended for one single dose! It is not practicable to use more as our conditions do not permit it. It may here be noted that the improvement in the mortality has been more or less proportionate to the amount of serum used.

Now for the points mentioned:—

1. *The virulence of the infection.*—If the

infection be a virulent one there is a chance that before treatment is commenced a sufficient amount of toxin will have been absorbed so as to seriously interfere with the vital centres. The current opinion is that toxin after becoming an integral part of the nervous system is impossible of neutralisation. Absorption is more likely to occur sooner when it takes place directly from the blood so that trismus is an early symptom. The more complete the latter and the sooner it appears in all its vigour, the more likely is the case to prove fatal, granting the wound to be outside the sphere of influence of the 5th nerve in which case lock-jaw appears very early. This exception, however, should not be too literally taken.

2. *The amount of toxin absorbed by the nervous system.*—This is far more important than the previous, although both exist as cause and effect. As already said, nothing can be done when a lethal amount of toxin is absorbed. A sublethal amount may be prevented from increasing by immediate and repeated injections of antitoxin, given preferably intravenously in non-sensitised cases, provided that the dose is large enough. This should be accompanied by sterilisation of the site of injury without any active surgical interference. Later experience has taught me that it is best even to discard cauterisation with carbolic acid.

3. Early involvement of the diaphragm and muscles of deglutition are very unfavourable signs and in all such cases serum has proved of no avail with me. This point was noticed quite early and has been amply borne out by later experience.

4. *The site of the wound and its character.*—It is well known that tetanus toxin is carried by nerve protoplasm of the motor nerves. This view has been based by Meyer and Ransom on their experiments with *tetanus dolorosus*. It stands to reason, then, that the closer the wound to the medulla, the shorter the route by which the toxin reaches the vital centres. Granting a degree of slowness of entry on the part of the toxin into the blood, one may reasonably expect the sole of the foot to be a more favourable site than the head. It should be remembered, however, that the situation of the wound is of no importance if the toxin is being poured into the blood in a stream or at any rate in a sufficient quantity to constitute a lethal dose, before it reaches higher up by its circuitous nervous route. This is what happens in the majority of cases with wounds below the neck, so much so that till quite recently early lock-jaw was considered one of the diagnostic features of tetanus.

Ragged wounds with a deal of undermining favour the growth of the tetanus bacillus for obvious reasons, these being deficient aeration

and difficulty of cleaning. Some cases of idiopathic tetanus are very severe and stand a poorer chance of recovery than many others equally severe the inoculating site of which is accessible to irrigation. This statement is based on two cases only.

II. My later experience with carbolic acid bears out what I first stated, *viz.*, that the drug often controls spasms when serum does not. It prevents in this fashion the exhaustion that adds so much to the gravity of the patient. As an adjuvant it is, in my opinion, to be recommended. It has not been tried independently.

III. In my earlier paper I had mentioned that one comes across cases with physical symptoms, temporary or permanent. Another such instance has come to my notice. It may be remarked that in one case these symptoms were present even before treatment was ordered, so that there is no reason to suspect drug influence. On these grounds I had ventured to suggest that they may be the clinical representative of the *cerebral tetanus* experimentally produced by Roux and Borrel. This was to some extent substantiated by post-mortem findings in one of my patients where the frontal lobes were found oedematous. Sections from this part of the brain showed mere congestion. The thyroid had excess of colloid and a hæmorrhage was present in one of the adrenals, as also in the medulla. For these findings I am indebted to Dr. Ajinkia of the Histological Laboratory.

IV. In my earlier experience I had noticed a case of general tetanus without any trismus. I was beginning to think that the site of the wound might have something to do with the delay of this symptom. It is needless to say that this has been amply disproved by my own experience. This point is fully dealt with elsewhere. Contrary to the possibility assumed by Golla, I had laid down, however, that this variation was not due to any prophylactic injections. None of my cases received a single prophylactic dose. I fully concur with his view that a longer incubation period is met with in such cases, thus suggesting that weakness of the toxin, however produced, or an increased resistance on the part of the patient, are the factors to be looked upon as the common causative factors.

V. Tetanus toxin is said to consist of tetanospasmin and tetanolysin. So far as I could ascertain, there has been no definite isolation of these substances effected. I am just trying to see if there is from the clinical point of view any justification for splitting the toxin into these two components. Comparison is notoriously uncertain in a disease-like tetanus. The uncertainty becomes all the greater when we have to deal with a symptom like anæmia, the etiological factors of which are so varied. With such prospects in view it is not possible to confidently expect any

reliable results; moreover, error in counting has to be reckoned with in appreciating small differences. Some reliance may be placed on two comparative counts taken on definite days in surviving cases and it is on these lines that my present work is being directed.

As regards treatment, this has been detailed in the paper referred to. I have come to the conclusion that the intravenous method is the best. As regards the intrathecal, I cannot lay claim to any conclusion as it has not been much used. Intramuscular injections in the few cases in which they have been used have not proved successful. The difference probably lies, when one compares with results of war experience, that I have had dealings entirely with non-sensitised cases. There have been no anaphylactic phenomena in consequence.

N.B.—Fixation of the diaphragm in a case of general tetanus does not mean a spasm of this muscle and may be brought about by other factors. This is not therefore an indication of fatal issue. But if it is an initial sign and if to this is added difficulty of swallowing, the course of the disease is, so far as my experience goes, invariably fatal. Of late I had a case where swallowing was the only thing interfered with. I find a reference to this in the monograph of Courtois-Suffit and Giroux, as also in the medical papers. This condition is described as *splanchnic tetanus*.

A CASE OF INTRA-PERITONEAL ABSCESS.

BY GOPAL K. TAMBE, M.A., B.Sc.,

L.M. & S.

BALLA, Hindu, aged 28 years, was admitted on 15th May, 1918, in the Main Hospital, with a large pyriform tumour, situated centrally over the bladder in the hypogastrium. It was about 4 inches in diameter horizontally; vertically it reached the umbilicus, and looked like a case of retention of urine. The case was then shown to me. I found distinct fluctuation in the tumour and pronounced it as a case of abscess in the abdominal wall.

On the following day he was prepared for operation and put on the table. As the tumour pointed distinctly in the left inguinal region I made a free incision over it and let out nearly two pints of foul-smelling pus. The stream of pus used to increase with pressure on the abdominal wall. I, therefore, suspected a deeper origin of suppuration and explored the cavity of the wound with my fingers. As anticipated I felt the coils of the intestines. Evidently it was a case of suppuration of mesenteric glands, tubercular in nature. Large masses of caseating material came out with the stream of pus. The patient did not keep any rise of temperature before the operation. But as cases of cold abscesses, once opened, soon become infected with streptococci and staphylococci, and subsequently give rise to fever and end fatally, it was feared that this case would do the same. I, therefore, secured two I. R. medium size drainage tubes in the wound and freely irrigated the peritoneal cavity with normal saline. This was done from day to day. In about 15 days the discharge completely disappeared. The patient never kept any rise of temperature even after the operation. The wound healed in three weeks. The patient improved rapidly in health.

Observation.—It has been taught that cold abscesses should not be freely opened and a drainage tube never put in for fear of the complications mentioned above. I have very often gone against this advice.

Indian Medical Gazette.

MARCH.

INDIGENOUS DRUGS.

WE have in this issue and in that for February 1919 (*vide* also March 1918 number) published very interesting articles on the claims made by the supporters of the ancient Hindu systems of medicine, which will show clearly to any unbiassed mind that no Government could possibly entertain any scheme for the furthering of such a system in this modern world. A system, as Lieutenant-Colonel Sutherland writes, which "teaches that drugs and natural excretions long since rejected in other lands should be used to-day in the treatment of disease can only be called antiquated." A system which teaches that the semen of mice is poisonous, that scorpions are generated by cowdung and by dead snakes, that a physician can gather valuable information as to a patient's disease before he sees him by observing the complexion, gait and caste of *the messenger* used, cannot seriously be considered, and has no right to demand that public money be spent on its encouragement.

While, however, we all agree that neither time nor money should be wasted on such obsolete absurdities, we are strongly of opinion that the time has come—indeed has long arrived—when a serious and scientific attempt should be made to investigate the indigenous drugs of India, and no time should be lost in appointing well-trained pharmacologists to the new Schools of Tropical Medicine in Calcutta and elsewhere to take up this important subject.

The War which has just ended has taught us many things, and in India we have learnt the grave disadvantages of being too dependent upon other countries for the necessities of life and trade, and this has proved to be so in the case of many drugs and medical and surgical necessities.

We have before us a very useful pamphlet* by Dr. J. C. Ghose, B.Sc. (Manchester), F.C.S., in which he makes a plea for the study of the indigenous drugs of India and for their scientific cultivation and manufacture in India.

He ably pleads for an investigation of the chemical and histological characters of such

indigenous drugs as may be found useful. This procedure, he tells us,

"will protect the public from the frauds now practised upon them by irresponsible manufacturers, will protect the indigenous Indian drugs from falling into disrepute, and will finally protect and develop an industry which offers promise of possibilities of great development, but which, in a large majority of cases, is still, unfortunately, left in the hands of untrained and unscrupulous men."

He goes on to say :

To enable the scientific investigation referred to above to proceed on right lines, it is needless to say that all possible care must be taken to ensure a collection of the unadulterated and the exact variety of the drug which it may be proposed to investigate. It is true that the recognition of crude drugs is no longer a necessary knowledge for a doctor, but while in the Western countries the collection and examination of crude drugs are undertaken by well-known firms, aided by a staff of experts, the work in India is, unfortunately, left to a class of ignorant bazaar people. Apart from the necessity for attaching an experimental drug farm to the Calcutta School of Tropical Medicine, drug cultivation by itself is an important industry for which India, with its great diversity of climate and soil, is admirably adapted, and which seems to deserve the attention of capitalists both here and abroad. This industry has not only been neglected in India, but in other countries as well, with the result that of recent years the growing of medicinal herbs formed the basis of a profitable industry amongst the Central European population, and that the outbreak of the War has brought about a great scarcity of these vegetable drugs. Until recently there were several articles in the Home papers drawing attention to the crying need for vegetable drugs, and to the necessity for a scheme of *systematic growing, collecting and marketing* of medicinal herbs, the idea being to encourage and to co-ordinate the cultivation of small crops in all parts of the United Kingdom. *If such a scheme is considered necessary in that country, it is more so out here, where the bulk of medicine-consumers depend mostly on herbs.*

A list of vegetable drugs as recognised by the British Pharmacopoeia, 1914, will be found in Appendix I to this pamphlet, and it may be interesting to know that about 50 per cent. of these drugs are indigenous to India and Ceylon, and that nearly the whole of the rest could be cultivated. Several of these drugs are very important, being used in large quantities and containing valuable alkaloids or other active principles. It may be mentioned here that a good deal of action on drug cultivation in India has already been taken by Government.

Among the drugs mentioned in this valuable pamphlet he mentions belladonna, which, as we on another occasion informed our readers, has been and can be successfully grown in India, as witness the experiments made in the Cinchona Plantations in the Darjeeling hills.

* Calcutta, Butterworth & Co. (India), Ltd. Price, 4s. 12.

Digitalis has also been cultivated in India, in the Nilgiris, and in Darjeeling District, and no doubt could be well grown in many other places.

Henbane or hyocyamus has been successfully cultivated in the Saharanpur Gardens. Ipecacuanha, so important on account of its alkaloid emetin, has been raised in the Darjeeling hills, and with care and attention can be cultivated with success.

Jalap grows "as easily as potatoes" in the Nilgiris. Podophyllin, the Indian variety of which was recognized by the B. P. of 1914, grows wild in India.

These are only a few of the everyday drugs which can be grown in India in quantity sufficient for the needs of the country and for export.

Drug cultivation alone, however, is not sufficient; modern physicians tend more and more to give up the use of crude drugs and to use only the active principles, the physiological and therapeutic action of which can be established by experiment and by experience.

To do this in India necessitates the employment of trained and expert chemists.

We strongly commend this useful little pamphlet to the notice of our readers. There is much to be done, and the sooner the work is begun in India the better.

Current Topics.

SECUNDERABAD KING EDWARD VII HOSPITAL.

MAJOR BRODRIBB, I.M.S., submits the report, which shows a marked increase in both in- and out-patients during 1917.

Operative Work.—There is a very considerable increase in this work, 477 major operations having been performed as against 346 in the previous year. This is exclusive of obstetric operations. This increase is very satisfactory, and is due to the fact that practically a whole-time medical officer was in charge throughout the year. The total mortality of operative cases was 4.8. This includes all moribund cases. Of the 477 major operations, 114 involved opening the peritonium. This number is given to show the class of surgery undertaken in the hospital.

A list of the more important major operations and a note on some of special interest is attached to the appendix.

The new King Edward VII Memorial Hospital was opened by the Honourable the Resident on the 20th December, 1917, and a report of the proceedings is attached to the appendix for record. All patients were transferred to the new hospital (except the maternity cases) on the day of opening, and it has been found to work extremely satisfactorily. The new hospital which is made to accommodate 142 beds, so as to provide for future requirements, has been furnished with the following number of beds.

Clinical Note.—Two ruptured extra-uterine gestations were admitted with very extensive hæmorrhage, both were pulseless on admission; both recovered after large and repeated intravenous salines and pituitrin given after the operation.

One very extensive vaginal vesical fistula, which offered no chance of cure by suture, had a colpocleisis operation performed; the immediate result was satisfactory; she returned some months later with severe urinary infection; she improved much under treatment, and was again discharged. It is doubtful if this operation is desirable among the uneducated who cannot keep themselves clean, the only justification being the great distress caused by the condition for which the operation is done.

During the year a number of tarsal cartilages were excised for advanced trachoma, with invariably good results. One case of prostatectomy was done on a very old man with marked symptoms of urinary insufficiency, the reason for doing it was that he lived in a village, and catheter would have meant an early death from sepsis; he did well and eventually left passing his urine naturally.

Two cases of abdomino-perineal excision of the rectum died. The shock from this very extensive operation is so great that the chances of an Indian with advanced cancer of the rectum are very small if he is submitted to this operation. He is perhaps better left with a colotomy and a few months of painful existence.

One case of excision of the cæcum and ascending colon for tuberculosis died of acute distension of the stomach from pressure of the superior mesenteric artery on the duodenum, as was shown by a postmortem examination. The case was fully reported in the *British Medical Journal*.

One very successful case of tartar emetic treatment of crescentic malaria was published, which gave one to hope that a cure had been found for obstinate cases of sexual malaria; however, further investigations with the drug were disappointing and its use has been abandoned; this is in agreement with the published observations of many other observers.

There was one very advanced case of kala-azar that appeared to be without hope of recovery, the patient on admission being wasted to skin and bone, with her spleen below the umbilicus, from which Leishman-Donovan bodies were obtained. She completely recovered her normal health after about sixty intravenous injections of tartar emetic.

The two cesarian sections did well.

SALE AND POSSESSION OF COCAINE.

THE President of the Bengal Council of Medical Registration has called the attention of all practitioners to the orders issued by the Governor of Bengal in Council on the need of passing a license to possess cocaine or other alkaloids of coca:—

No druggist or chemist, medical practitioner or dentist, shall possess any coca leaves, alkaloids of coca, any other drink or substance prepared from the coca plant (*Erythroxylum coca*), or any drugs, synthetic or other, having a like physiological effect to that of cocaine, or any preparation or admixture thereof (other than preparations which are for the time being exempted from the provisions of the Act relating to possession and sale by a subsisting Notification issued by the Local Government under section 90), except in accordance with a license granted under the said Act, or in a quantity exceeding the limits specified below, viz:—

By a licensed drug-	One ounce of all	} Or such smaller or larger quantity as may be fixed by the Excise Commissioner in any individual case.
gist or chemist.	varieties of the drugs taken together.	
By a licensed medi-	Half an ounce of all	}
cal practitioner or dentist.	varieties of the drugs taken together.	

FRACTURES IN WARFARE.

SIR ARBUTHNOT LANE has a valuable article in *The Practitioner* (October 1918) on fractures in warfare which is worth reproducing. We quote his conclusions:—

1. That only in very exceptional circumstances is it advisable to fix fragments of broken bones together by means of plates and screws whilst the wound is foul.

2. That if, for certain reasons, such a procedure is deemed necessary, screws should not be inserted near the broken extremities, but as far from the seat of fracture as possible.

3. That it is advisable to postpone operative interference till the wounds have healed for some considerable time, and until the tissues are, in all probability, free of organisms. This can usually be determined with reasonable certainty.

4. That if any apparently septic focus is observed during an operation, a culture and a vaccine should be obtained from it, and employed at once should symptoms of infection of the wound develop.

5. That should there be any definite suspicion of the presence of latent sepsis, irrigation by Carrel's or similar method must be adopted at once. If not, the wound should be closed completely at the time of operation.

6. That every attempt should be made to avoid any shortening of the limb, or to reduce it to a minimum.

7. That the apposition of the whole areas of the broken ends is not necessary, since the interval will fill up subsequently by bone if suitable means are adopted. Fragments of bone or callus should be saved and employed to fill any interval between the pieces of the shaft.

8. That much heavier steel plates are required in this class of case than are usually employed in the less comminuted fractures of civil life. It is most important that the muscles and joints, which are in relation with the fractured bone, shall be moved voluntarily by the patient as soon as possible after the operation, in order to avoid that stiffness and limitation of movement that so often complicate these fractures. This is especially the case in the joints of the knee, ankle, and foot. In order to obviate this trouble, without risking the security of the junction, the plates which are employed to retain the fragments in position must be as long and as strong as circumstances will permit. They should be secured by as many screws as possible. The plates that are often employed are quite inadequate for the purpose. It is obvious that such early treatment cannot be adopted when the fragments are very fragile and the grip of the plate and screws insecure.

9. That providing no strain shall be exerted on the junction likely to develop non-union, the sooner the patient who has been operated on for fracture of one or more long bones of the leg is got up and about, the more bone will be deposited and the more rapid will be the repair at the seat of fracture. For this purpose a good ambulatory splint is a necessity in certain cases.

10. That, should the interval between the fragments be so considerable that union is not likely to take place, even after prolonged congestion brought about by the use of an ambulatory splint, the fragments should be secured in perfect alignment by a plate fixed vertically behind the centre of the shaft. When this has been done a portion of one of the fragments, which is usually equal in thickness to a third of the total circumference of the shaft, can be sawn and chiselled off and secured over the interval between the fragments, any piece of bone removed to accommodate the graft in the other fragment being fitted to occupy such existing interval as may be left between the bones. If enough material cannot be obtained from the fractured bone to make a graft, it must be got from some other bone.

11. That most of the failures of bone grafting for extensive loss of substance are due to the surgeon depending on the unsatisfactory grip which the graft alone can be

made to exert upon the fragments of the shaft. The essence of success depends on the absolute immobilization of the fragments of the shaft on one another, and of the graft upon those fragments. It is obviously ridiculous to attempt to retain the fragments of bone in a useful position by bone grafts alone in these compound fractures produced by projectiles, as it is in any fractures in which the material securing the fragments in position has to bear considerable strain. In grafting bone into gaps in the lower jaw, fixation is supplemented by interdental splints which lock the jaws.

12. That much has been written about wire screws and plates acting as foreign bodies if used in simple fractures, and producing a rarefying osteitis around them. Should such rarefying osteitis exist, it is undeniable evidence that the technique of the operator is faulty and not the procedure. The remedy is in the hands of the surgeon, who must improve his methods. Frequent failures in unskilled hands have led many to attribute their want of success to the employment of steel plates and screws, and to attempt to avoid sepsis by using other and much less effective means.

13. That while the operative treatment of compound fractures produced by projectiles is the most important of all surgical procedures in warfare, it is, perhaps, well to remember that it may demand a degree of asepsis, mechanical skill, resource and judgment in excess of that required for other operations for war conditions.

14. That, besides that of sepsis, usually introduced from without though occasionally developed from a latent infection, hæmorrhage is the chief risk which is associated with these operations. This can be best avoided by the use of very powerful hæmostatic forceps, which are left in position in the wound for as long as possible during the course of the operation. A ligature is rarely required. It is most important that the wound should be left as dry as possible. When much oozing is expected to follow the operation, a long drainage tube may be left in the wound for twenty-four hours, and so arranged that the extravasated blood may be carried free of the dressings. The removal of the tube does not necessitate any change of dressings, for they are not moistened by the blood.

THE PREVENTION OF SCURVY.

THE Royal Society (Food, War Committee) have published the following valuable note, based on investigations made at the Lister Institute:—

THE CAUSE AND PREVENTION OF SCURVY.

1. Scurvy, like beri-beri, is a "deficiency disease," and is due to the long continued consumption of food lacking in an accessory food substance or vitamine. The view that scurvy is due to tainted food must be abandoned.

2. This vitamine is contained in a number of fresh foods: in largest amount in oranges, lemons, and fresh green vegetables; in considerable amount in roots and tubers, such as swedes, potatoes, etc.; and in small quantities in fresh meat and milk. It is deficient in all dried and preserved foods.

3. It is destroyed by prolonged heating, such as takes place during stewing. Thus potatoes in stews would be devoid of vitamine, but if boiled rapidly will still contain some quantity. Alkalies rapidly destroy anti-scorbutic properties. Soda should therefore not be added to the water in which vegetables are soaked or boiled.

4. Before the onset of definite symptoms of scurvy there is a period of debility and weakened resistance to disease. The occurrence of cases of debility in any body of troops without sufficient cause should at once direct the medical officer's attention to the sufficiency of the diet.

Prevention of Scurvy

5. West Indian lime juice, as ordinarily prepared, is useless for the prevention of scurvy. Fresh limes have

an antiscorbutic action, but their efficiency is only one-fourth that of lemons. The so-called "lime juice," by the regular administration of which scurvy was eliminated from the Navy during the first half of the nineteenth century, was really lemon juice obtained from the Mediterranean. The history of Arctic exploration affords numerous examples in which scurvy was prevented for long periods of time by the agency of lemon juice regularly taken. Nares's expedition of 1875, notorious for the serious outbreaks of scurvy encountered, was the first to be provisioned with "lime juice" prepared from West Indian limes. Orange juice is as effective as lemon juice.

6. Potatoes and root vegetables have a distinct value in the prevention of scurvy—much less, however, than green vegetables or fresh fruit juices. A daily ration of 14 oz. of potatoes, boiled rapidly but not stewed, will suffice to prevent scurvy.

7. Pulses, beans, peas, and lentils in the dried condition have no antiscorbutic properties. If, however, the dried seeds are soaked in water and are allowed to germinate for a short period, one or two days, they develop the antiscorbutic vitamine. At the same time, these pulses are also rich in the vitamine which prevents beri-beri, and are, moreover, valuable foods.

The method adopted for germination is as follows: The beans, peas, or lentils are soaked in water at room temperature (60°F.), for twenty-four hours. The water is then drained away, and, to permit germination, the soaked seeds are spread out in layers, not exceeding 2 to 3 inches in depth, and kept moist for a period of about forty-eight hours at ordinary room temperature (60°F.). They should not be allowed to dry after this operation, but should be cooked as rapidly as possible (lentils, 20 minutes; peas, 40 to 60 minutes).

8. The antiscorbutic value of fresh meat is very low in comparison with that of fresh vegetables and fruit. If fresh meat is consumed in large quantities, 2 to 4 lb. a day, scurvy will be prevented. Tinned and preserved meats possess no antiscorbutic value. Frozen meat, while more valuable than preserved meat, must be considered inferior to freshly killed meat in this respect.

Methods of Cooking.

9. The destruction of the antiscorbutic properties depends rather upon the time than the temperature employed. All foods, especially vegetable, should be cooked for as short a time as possible at boiling point. Slow methods of cooking, such as stewing with meat or simmering below-boiling point, should be avoided. Potatoes should be plunged into boiling water and the boiling continued for twenty to thirty minutes after the boiling-point has again been reached. Frozen meat should be roasted when practicable.

SUMMARY OF MEASURES RECOMMENDED FOR THE PREVENTION OF SCURVY WHEN FRESH VEGETABLES ARE UNOBTAINABLE.

- (a) The lime-juice ration should be replaced by lemon juice. The ration should be 1 oz. daily served with sugar.
- (b) Cooked germinated peas, beans, or lentils should form part of the regular daily ration.
- (c) Attention should be paid to the methods of cooking employed, as set forth under 9.

THE WEIGHT OF LIMBS: NATURAL AND ARTIFICIAL LIMBS COMPARED.

It happens not infrequently that a man who does not find it easy to manage an artificial limb believes that his difficulty is due to the weight of the appliance. At the instance of Colonel J. Lynn Thomas, C.B., C.M.G., Surgeon to the Prince of Wales's Hospital for Limbless Sailors and Soldiers at Cardiff, Professor A. Keith, F.R.S., Conservator of the Museum of the Royal College of Surgeons of England, has supplied some information, which has been printed on a card at the Welsh Orthopaedic Centre Curative Print Shop.

The information supplied by Professor Keith is as follows:

The total weight of a lower extremity is 18.6 per cent. of the body weight, and the total weight of an upper extremity 6.38 per cent. of the body weight. In a man weighing 11 stone (154 lb.), a lower extremity would weigh 28.65 lb., made up thus:

Thigh	...	11.6	per cent. of body weight	=	17.85	lb.
Leg	...	5.2	"	"	=	8.0
Foot	...	1.8	"	"	=	2.8

18.6 per cent. of body weight = 28.65 "

An upper extremity would weigh 9.8 lb., made up thus:

Upper arm	...	3.3	per cent. of body weight	=	5.1	lb.
Forearm	...	2.28	" "	=	3.5	"
Hand	...	0.8	" "	=	1.2	"

6.38 per cent. of body weight = 9.8 lb.

For comparison Colonel Lynn Thomas has supplied us with the weights of the standardized artificial limbs made for the patients at the Prince of Wales's Hospital, Cardiff:

	Lower Limb.	lb.
For disarticulation at the hip (including tilting table)	...	9
For amputation through the upper thigh (with pelvic band)	...	7½
For amputation through the middle thigh	...	6½
For amputation through the knee	...	6
For amputation below the knee	...	5½
For Syme's amputation	...	3½

	Upper Limb.	lb.	oz.
For disarticulation at the shoulder	...	3	10½
For amputation above elbow	...	2	12½
For amputation below elbow	...	2	4½
For amputation of the hand	...	0	7½

—[From the *British Medical Journal*.]

ASCITES IN CHINA.

DR. W. W. CADBURY has a useful article on a study of cases of ascites in China hospitals. His conclusions are as follows [*China Medical Journal* (September 1918)]:

1. Ascites is a common condition in the medical wards of a hospital in Canton.
2. This condition is most frequently associated with cirrhosis of the liver or chronic nephritis, but splenomegaly; heart disease, tuberculous peritonitis and abdominal tumors are also causative factors.
3. The male sex is more prone to ascites than the female, and most cases occur between the 20th and 60th years.
4. The majority of cases with ascites give an alcoholic history.
5. Although the Chinese are largely vegetarian in their diet, and seldom eat salt, nephritis associated with oedema is by no means uncommon.
6. Ascitic fluid tends to recur after tapping, especially in cases of cirrhosis of the liver and splenomegaly. The best results were obtained where the ascites was caused by heart or kidney disease.

WE understand that Lt.-Colonel R. H. Elliot, I.M.S. (Retired), formerly Ophthalmic Surgeon, Madras Medical College, has consented to be nominated as a candidate for election to the Council of the Royal College of Surgeons of England. Now that the voting papers are sent out three months before the election, Fellows resident in India are enabled to vote, and as votes equal to the number of vacancies can all be

given to one candidate, if most of the Fellows resident in India, both service and non-service men, plumped for Lt.-Colonel Elliot, the chances of electing a candidate to represent this country are very good. Any Fellows who have changed their address during the last few years would be well advised to notify the Secretary of the College of Surgeons, Lincoln's Inn Fields, London, E. C., so as to ensure receiving their voting papers.

Reviews.

Advanced Suggestion.—By HADYN BROWN, L.R.C.P. (Edin.) Baillière, Tindall & Cox, 1918.

It is difficult to know if the author of this small volume wishes to be taken seriously or not. The great value of suggestion in treatment is fully realised and acknowledged by the profession to-day, but if all Dr. Hadyn Brown claims for his methods is true, then he has certainly reached an unthought-of pinnacle of success and his system beats all other methods of treatment by suggestion or indeed anything else clean out of the field. Nine-tenths of his book is taken up with illustrative cases of cures, and we read with wonder of chronic eczemas, diabetes, disorders of menstruation, and even new growths disappearing at the word of command. Nor is surgery forgotten, for hæmorrhoids, varicose veins, prolapsus ani, inflammations and œdemas all come within the scope of Dr. Brown's healing power. The whole book is a startling profession of faith, and will need further substantiation before it will be accepted by the profession.

Re-education of the Maimed.—By JEAN CAMUS. Translated by Surgeon W. F. CASTLE, R.N. London: Baillière, Tindall & Cox, 1918.

THIS is the authorised translation of a work by Dr. Jean Camus, which is regarded as the most complete French work dealing with the physical and occupational re-education of the wounded in war. To make it more complete, Surgeon Castle, R.N., the translator, has added four chapters on the work done at St. Dunstan's, the Lord Roberts Workshops, and the Roehampton Hospital.

It will be found of the greatest use to those interested in orthopædic work in India.

The four appendices will be found also most interesting as they give a brief and good account of the work done in England. The Limb-fitting Hospital at Roehampton is a splendid institute, and others have been established at Glasgow, Edinburgh, Dublin, Belfast, and Cardiff.

We can strongly recommend this little book.

Sanitation in War.—By Lt.-Col. P. S. LELEAN, C.B. F.R.C.S., R.A.M.C. 3rd Edition. London: J. and A. Churchill, 1916.

THIS little volume is one of the book successes of the war. First published only in May 1915,

in less than four years it has appeared in one reprint and three editions.

It is essentially a book for the medical officer under field service conditions. It is full of up-to-date information; it is compact, small and easily carried; and it is, above all, accurate and reliable.

The present edition has but few changes, but the public asked for more, and the publishers insisted on the author, "Somewhere in Palestine," complying with the demand.

We can again strongly recommend this neat little volume, as the best book going on war sanitation and its many problems.

The British Journal of Surgery, Vol VI.—No. 22, October, 1918. Issued quarterly. Single numbers 8s. 6d. net. Subscription, 31s. 6d. net, per annum, post free. Bristol: John Wright & Sons, Ltd

BENJAMIN BRODIE'S biography is the first article, and follows the usual type of this publication.

The third lecture on bone growth and repair by Professor Arthur Keith follows, and chiefly consists of a comparison of Ollier's and Macemen's work on the subject.

There is a useful paper on weight extension in the treatment of war fractures by Lieutenant W. H. Ogilvie, R.A.M.C. (T.C.). The Blake splint is fully described and strongly advocated in conjunction with Blake's suspension-extension frame. The descriptions of the apparatus are clear and the paper is essentially a practical one.

Major S. Alwyn Smith, D.S.O., has a good paper on the diagnosis and treatment of injuries to the crucial ligaments founded on nine cases. He has modified Hey-Grove's original operation of substituting a strip of fascia lata for the crucial ligament by making one piece of fascia do duty for both the crucial and internal lateral ligaments. The operation appears to have a future before it.

E. W. Hey-Groves has a long and interesting paper on ununited fractures from gunshot injuries and the use of bone grafting. It is based on a series of 60 consecutive cases in the author's practice, and is an honest account of failures and successes. Discussing the causes, it is found that loss of substance is by far the most important—56.6 per cent. of this series—and that this non-union is in some cases due to very free removal of bone fragments shortly after the infliction of the injury.

Gross displacement is the next most common cause of non-union, while necrosis and eburnation of the bone ends come a long way behind; necrosis as a cause of delayed union is fully recognised, but it comparatively rarely causes actual non-union.

In discussing the conditions before proceeding to operative treatment, the rôle of latent sepsis is fully considered, also the effect of the amount of scar tissue present. As regards the first point, the author was at first, like many of us, sceptical

about this latent sepsis, but now thinks that three months after the healing of the wound should be the minimum period before operation is attempted, and that in many cases it is as well to wait longer. The importance of maintaining the nutrition of the parts is thoroughly emphasized.

The various operations for the treatment of non-union are discussed: the step-cut operation for the humerus and forearm bones is as a rule very suitable.

The plan of introducing a long intramedullary peg from the trochanter in fractures of the upper end of the femur is distinctly ingenious, and although, as the author admits, the results in this series are not particularly good, yet it is a procedure which will probably become popular. The special section on bone grafting is excellent.

It is impossible to refer in detail to the other papers in this number on account of the limitations of space—not that they are less worthy of notice than those mentioned above, for they all show evidence of careful work.

There are various papers on nerve surgery and joint injuries of the upper extremity. One paper on the end-results of primary excision of the elbow, showing how bad they are when the re-section of bone has been extensive, should be remembered.

The usual high standard of illustrations, etc., is fully maintained.

Abstracts of War Surgery prepared by the Division of Surgery.—Surgeon-General's Office, St. Louis, U. S. A.: C. V. Mosley Company. Price 4s.

THESE abstracts were collected when America entered the war, the object being to place the surgical work which had been done by the various belligerents in a handy form in the hands of surgical instructors and surgical chiefs of war hospitals.

It was found that there was a wide demand for them: hence their present publication in book form.

The various articles are collected under appropriate headings, *i.e.*, wound infection and treatment, fractures, etc., etc.

The collection has been made from wide sources—in fact, from the literature of nearly all the fighting nations.

The extracts vary in length according to their importance, in some the original article being reproduced in full. The book gives in a compact way the chief points of the various papers and will enable the reader, if he desires any further information, to obtain the original article as the references are complete.

Tumours: Their Nature and Causation—By Dr. D'EMERY, M.D., B.Sc. (Lond.). Pp. 146. London: H. K. Lewis & Co., 1918. Price 5s

THIS little book is a special plea for the parasitic hypothesis of the causation of all, or

almost all, tumours. If the author's three postulates be granted, *viz.*, (1) an ultra-microscopic parasite, (2) intra-cellular or intra-nuclear site, and (3) that it produces a toxin which has the power of inducing cell division, a satisfactory explanation of tumour formation can be formulated. The author marshals his facts and arguments clearly and concisely, and the essay makes interesting reading. The final chapters in which he meets objections, which may be urged against the theory, show him to be a master of the art of debate.

The Influence of Sunlight in the Production of Cancer of the Skin.—By C. NORMAN PAUL, M.B., Ch.M. Pp. 57. London: H. K. Lewis & Co., 1918. Price 10s. 6d

THIS book is an atlas with descriptive letterpress of the cancerous and precancerous conditions of the skin, in the aetiology of which sunlight is supposed to play a part. The majority of the plates illustrate the features of rodent ulcers, but in addition chronic solar dermatitis, cutaneous horn and epithelioma are illustrated, whilst xeroderma pigmentosum is described but not illustrated. The illustrations are reproductions from photographs and are on a large scale; on the whole they are very successful.

Surgical Applied Anatomy.—By Sir FREDERICK TREVES, Bart., G.C.V.O., etc. Seventh Edition, revised by ARTHUR KEITH, M.D., F.R.C.S., and W. COLIN MACKENZIE, M.D., F.R.C.S. London: Cassel & Co., 1918. Price 10s. 6d. net.

THERE is little left for a reviewer to say about a book of such proved utility as Treves' Surgical Anatomy. The alterations which the revisers have made in the book have been directed towards making it more useful to military surgeons, the sections on anatomy of nerves and on paralyses and joints having been somewhat expanded. The retention of the old nomenclature (the new terms being inserted in brackets) will be welcomed by many. Some new figures illustrating distribution of peripheral nerves will be useful, as also several figures of amputations. The present edition worthily maintains the reputation of this standard work.

"Fibroids" and Allied Tumours: Their Pathology, Clinical Features and Surgical Treatment.—By CUTHBERT LOCKYER, M.D., B.S., &c. 316 Illustrations and 37 Coloured Plates. Publishers: Macmillan & Co., 1918.

THIS is a very fine and complete monograph, the principal interest of which lies in that part dealing with Adenomyomas, which, as the author rightly states, "have scarcely received the attention from British writers which is their due, and an extra-uterine origin for some of these growths needs emphasizing."

Part III deals with treatment, surgical and otherwise. One is pleased to see a whole chapter

devoted to intestinal and ureteric surgery, as the writer holds that no one should undertake the surgery of the pelvis unless he has the requisite knowledge and experience to deal with intestinal and other complications.

The book is beautifully illustrated, some of the coloured plates being very fine. It ranks as a standard work of reference.

The Statics of the Female Pelvic Viscera, Vol. I.—By R. H. PARAMOR, M.B. (Lond.), F.R.C.S. (Eng.). Pages xviii + 383. Demy 8vo. Publishers: H. K. Lewis & Co., Ltd. Price 18s. net.

IN this volume are set out the author's original views, hitherto only available in various papers, regarding the important part that the musculature of the pelvic floor plays in the support of the viscera.

The subject is here treated from the academic standpoint, the treatment of prolapse from the author's point of view, and the evidence of surgery, being reserved for Vol. II, the appearance of which will be awaited with interest.

The author goes deeply into his subject and the work requires careful study, as it is of great interest to the anatomist and to the gynaecologist.

The chapters dealing with the position of the uterus, intra-abdominal pressure and how it is maintained, the fixation of organs, the pelvic floor and visceral mass in the normal during straining, all repay study and throw new light on the statics of the viscera of the female pelvis.

Medical Society.

SIND MEDICAL UNION.

DISCUSSION ON INFLUENZA.

Recent Influenza Epidemic.

A VERY interesting discussion was held recently in the rooms of the Sind Medical Union, Karachi, on the recent "Influenza Epidemic." Most members of the Union were present, the chair being occupied by Dr. V. E. Nazareth, the President of the Union.

Lieutenant-Colonel W. S. Willmore, I.M.S., in opening the debate, viewed the whole situation from personal experience. He said that early in the epidemic it was the question of blind leading the blind. In fact, before the disease actually broke out, he had some misgivings of its approach, and when it did break out, a difficulty was experienced in recognising the same. The epidemic broke out practically simultaneously in all parts of Karachi, although he did not consider that it was highly infectious for reason of great immunity enjoyed by medical practitioners.

As to treatment, he thought that at present there was no particular drug treatment. Drugs like emetine, hæxamine, etc., employed in the beginning, soon came into disuse. Every case was a law in itself. The routine mixtures published in the papers by different health officers were useful in a way, as these imparted a certain sense of security and had good moral effect on the public mind.

The most important factor in the treatment of the disease was efficient nursing; plenty of fresh air by day and night were extremely important adjuncts. As to expectorants, he considered that these were more often bad than good, and when used injudiciously, they acted as irritants leading to inflammation of lungs. If the cough was dry and harassing, ammon. carb. and iodides may be given. No cough, no sedative expectorants. For pyrexia, diaphoretics were useful. He also used acid aceto-salicylic where indicated. As to cardiac stimulants, his knowledge was limited, but he relied mostly on strychnine, camphorated oil, etc. For sleeplessness he advocated small quantities of opium, and for constipation, castor oil. As to food, he was not inclined to be too severe, as no bad results issued from allowing small quantities of dry solid food. As to clothing, he considered Indian gauze next to the skin with loose woollen garments over it quite enough. In prognosis, respiration was his chief guide. For the care of the mouth and tongue he advocated the use of Listerine and the time-honoured boracic acid, etc.

Dr. G. T. Wrench, M.D., who next rose, said that he was in a sense associated with Major E. D. W. Greig, I.M.S., C.I.E., the eminent bacteriologist, in the bacteriological research work in this connection. He thought that Major Greig had found a bacillus which he called *Parameningococcus*, and he was inclined to think that the disease was cerebro-spinal fever. But he subsequently found other cocci as *Micrococcus catarrhalis* associated with other micro-organisms as pneumococcus streptococci, and with difficulty could find the real influenza bacillus of Pfeiffer, which was difficult to grow separately. He agreed entirely with Colonel Willmore's observations, etc., but differed from him when he said that the disease was not so highly infectious. His view was that it was actually very infectious, and that alone accounted for its rapid spread all over the world. He himself was a victim to it. He advocated the use of autovaccines. He concluded by remarking that devitalization of the human body all over the world on account of the world war had a lot to do with the present epidemic.

Dr. D. G. Advani, D.P.H., who followed him, said that he agreed in a large measure with the line of treatment adopted by the previous speakers, but took leave to differ from them both in so far as the hæxamine treatment

was concerned. He said that he took good care to see that this treatment was at once dropped before he gave advice, because he felt convinced that this was not necessary. Plenty of plain water even was enough to encourage excretion. He thought with Lieutenant-Colonel W. S. Willmore that there was no specific drug treatment yet found out and therefore the line of treatment adopted by him was symptomatic and expectant. Ordinary diaphoretics were usually enough to allay the symptoms. In severe cases, however, neither these nor hæxamine he thought of much value. As to cardiac stimulants, he did not think much of digitalis or strychnine injections, but relied chiefly on a good dose of brandy and spartein given hypodermically, although the former also had the place of honour. Dr. G. Pires, D.P.H., wanted to be informed as to how hæxamine acted. This drug was originally introduced to the profession as a urinary antiseptic, and the value of it depended on the evolution of formaldehyde, which could only occur when it came in contact with an acid fluid. Although since its introduction it had been used for various diseases, such as cerebrospinal fever, middle ear disease, etc., where it was found to be useful, yet these fluids were of alkaline nature.

Dr. Kotak, L.M.S., said that he had used hæxamine and had found it useful.

Dr. Rewachand, L.M. & S., said that he had found certain physical signs in one lung, and on turning over the patient these disappeared absolutely. He would like to know the cause of this; also as to varying different opinions on the condition of the lungs by different medical authorities on the same patient from a diagnostic point of view.

Dr. Talati, D.O., said that he had seen cases of cerebrospinal fever during this course.

Dr. V. E. Nazareth in winding up the debate said that his experience was practically the same as of Colonel W. S. Willmore. He laid great stress on perfect rest and efficient nursing. He advocated the use of opium where indicated, as it gave great rest to the patient and improved his pulse.

SPECIAL ARTICLES.

I

SOME REMINISCENCES.*

By COLONEL KENNETH MACLEOD, I.M.S.

THE late Nottidge Charles Macnamara, F.R.S., Eng., Surgeon-Major, Indian Medical Service (retired). Some reminiscences by Colonel

* On the eve of resigning the Service and the Editorship of the *Indian Medical Gazette* after nearly 20 years on it, the Editor has great pleasure in publishing the following notes by Colonel Kenneth Macleod, F.R.C.S., I.M.S. (retd.), for many years Editor, on a colleague of his, Surgn.-Major Macnamara, who also edited the *Gazette*.—Walter Buchanan, Editor, *I. M. G.*, since 1898.

Kenneth Macleod, M.D., LL.D. I.M.S. (retd.), Honorary Physician to His Majesty the King.

This distinguished member of the Indian Medical Service died suddenly of apoplexy on the 21st of November, at Chorley Wood, Hertfordshire, at the ripe age of 86. As a close relation by marriage and intimate friend of forty-eight years' standing, I gained a knowledge of his career both in Calcutta and in London, and of interesting and important circumstances and events in which he was concerned and which are deserving of recall and record. The main facts of his life and work are set forth in an appreciative obituary notice which appeared in the *British Medical Journal* (30th November, p. 619), which, however, contains some inaccuracies. When I settled in Calcutta in the year 1870, the Macnamara brothers, Francis and Nottidge Charles—*par nobile fratrum*—held professorships in the Calcutta Medical College and engaged in private practice with much acceptance and profit. The former was Professor of Chemistry and Chemical Examiner, and the latter Professor of Ophthalmic Surgery and Superintendent of the Chandney Hospital for natives. The writer of the notice in the *B. M. J.* is in error in stating that Macnamara "founded and organised the Mayo Hospital, a large General Hospital for Indians in Calcutta, of which he was the first Surgeon-Superintendent." The hospital for Indians with the affiliated dispensaries had existed long before his time, and among former Superintendents were Surgeons Nicolson and James Ronald Martin, two eminent officers of the Indian Medical Service.

It was known as the *lal hospital* (red hospital) on account of the free use of iodine introduced by Martin for injection into hydroceles and other purposes. What Macnamara did was to transfer the Native Hospital, from the crowded quarter of the native town in which it was situated, to a larger and better building on the left bank of the Hooghly. This measure was, with the full approval and support of Government and the Governors of the hospital, carried out with characteristic energy by Macnamara, who collected funds, commandeered a good site, eligible on sanitary and sentimental grounds, and succeeded in erecting a building constructed in accordance with the best principles of the time. The new hospital was named in honour of the Viceroy, Lord Mayo, and Macnamara's efforts were recognised by a subscription portrait painted by Watts, which hangs in the Governors' Committee room. My earliest acquaintance with Macnamara was through Surgeon-Major J. T. C. Ross, Secretary to the Inspector-General of Hospitals, Indian Medical Service (Dr. John Murray), and Editor of the *Indian Medical Gazette*. The first issue of this journal was, curiously, coeval with my arrival in Calcutta in January 1866. The first number was handed

to me by Surgeon-Major Thomas Farquhar, Surgeon to the Viceroy, Lord Lawrence. I became a frequent contributor to the *Gazette*, and while serving on the Cattle Plague Commission had helped Ross with leaders and reviews, as well as secretariat work. Macnamara was intimately acquainted with Ross and had frequented the Medical Office for the purpose of overhauling the voluminous proceedings of the Medical Board, beautifully hand-written in a series of well-bound and well-preserved tomes, and extracting from them interesting material, which he contributed to the *Indian Medical Gazette* and utilized largely in the *History of Asiatic Cholera*. I succeeded Ross as Secretary in the Medical Department in January 1874. He was within a short distance of promotion to administrative rank, and, in anticipation, proceeded on furlough to England. Ross arranged that Macnamara and I should conjointly edit the *Indian Medical Gazette*, and this association continued until he left India early in 1874. Our relations in conducting the journal were most harmonious, and our views of medical matters—scientific and administrative—closely coincided. The principles that guided us in our responsible task, for the *Indian Medical Gazette* was widely circulated among officers of both the British and Indian Medical Service, were these:—

1. We endeavoured to uphold the position and interests of the medical profession and services.

2. We strongly condemned the divorce of sanitation from medicine—the creation of a separate and antagonistic agency of prevention as dissociated from curative practice.

3. We utterly disapproved of the constitution of the sanitary service, which consisted of several heads—imperial and provincial—without an executive, claiming service from medical officers in military and civil employ, on whom was thus imposed a double allegiance and duty.

4. We vigorously and continuously attacked the doctrines and methods held and practised by the sanitary staff, who advocated investigation of disease—especially of epidemic disease—by means of statistical and other generalities instead of clinical and pathological research. I wrote a series of articles on the *fallacies of epidemiology*, in which I exposed the futility of Bryden's arithmetical and geographical deductions from data of questionable accuracy and value. As a means of evolving etiological discoveries leading to effective preventive effort, the Imperial Sanitary Commissioner, J. M. Cunningham, went so far as to exalt these vague deductions into the category of "great facts," while the results of the study of individual cases and local outbreaks and their circumstances and surroundings were denominated "little facts." In holding and advocating these views, we affirmed and perpetuated

Ross's ardent contentions, and incurred the displeasure of men in high places, who took us to task for our writings; but the recent history of medical research in India has fully confirmed the correctness of our tenets.

While concerning himself largely with administrative questions, including suggestions as to the reorganization of the Service, Macnamara did not neglect clinical and pathological work. With the use of a powerful microscope he made some interesting observations on the structure of muscular tissue and the shedding of intestinal epithelium in cholera. He made important contributions to the etiology of this disease. He was a strong advocate of the agency of water in its dissemination, and the remarkable incident, recorded in his *Treatise on Asiatic Cholera*, of the infection of several natives by diluted cholera stools undergoing putrefactive fermentation, gave strong support to the so-called water theory. His book on *Diseases of the Eye*, of which five editions were published, attests his keen study of this class of diseases. He invented a method of extracting cataract by means of a spud and scoop. The incision was made by the former and the scoop was introduced by slight pressure on its edge, the cataract was turned on its axis, fell into the hollow of the scoop and was easily withdrawn in its capsule. I had charge of the Eye Infirmary for a month during Macnamara's absence on leave and performed this operation in many cases. I found that the extraction was easy of accomplishment, but that loss of vitreous was inevitable and in some cases considerable. The Native Hospital gave great opportunities of observation and practice. He devoted special attention to diseases of bones and joints, on which he published a book which went through three editions.

Becoming aware of an opening which gave promise of a successful career in London, Macnamara left India in 1874 and retired in 1876, with the rank of Surgeon-Major, after 22 years' strenuous service, mostly spent in civil employ. As an assistant surgeon he saw some fighting in the Sonthal insurrection, and during the Sepoy Mutiny was surgeon of the Tirhut Volunteers, but did not see any fighting. He was then Civil Surgeon of Mozufferpore (not Mirzapur as stated in the *B. M. J.*), and held a prominent and popular position in the indigo districts.

In London, Macnamara found a new and rich field of labour. He was appointed Surgeon and Lecturer on Clinical Surgery to the Westminster Hospital and Surgeon to the Royal Westminster Ophthalmic Hospital. In both capacities he maintained those professional interests and pursuits which he had followed in Calcutta. He took a house in Grosvenor Street and went in for consulting work, which met with much success. He found time to be an active member of the

Council of his College, of which he was elected Vice-President. He also occupied important offices in the British Medical Association. He devoted himself with characteristic ardour to medical politics. He was a strong advocate for the creation of a teaching university for London, and urged the need of facilities for obtaining medical degrees in the metropolis. His literary activities were in continuous evidence. He delivered the Bradshaw lecture on Osteitis and the Hunterian oration on the Human Skull in relation to Brain Growth. He issued revised editions of his books on bones and eyes, wrote on cholera and tetanus for *Quain's Dictionary* and on cholera and leprosy for Davidson's *Hygiene and Diseases of Warm Climates*. During my residence in London from 1893 to 1898, I renewed my intimacy with Macnamara and saw a good deal of his work which was characterised by his usual energy and care. On his retirement from active work in 1897 he took a house at Chorley Wood, Hertfordshire. He indulged in gardening and golf, but continued to read and write diligently. His latest studies and publications concerned psychology and ethnology. He wrote on the *Origin and Character of the British People*, on the *Evolution of Purposive Living Matter* and on *Human Speech*, and gave an interesting account of his ancestry in the *Story of an Irish* (not Indian as in the *B. M. J.*) Sept. His last publication was a book on *Instinct and Intelligence*, in which he demonstrated that functional development of the brain depended on structural evolution and complexity. He insisted on the importance of systematic training of the mental faculties by attention to general and cerebral hygiene and the practice of all measures calculated to quicken and improve structural activity.

I wrote a long review of this book in the *Caledonian Medical Journal*, and this, together with subsequent articles on *Dreaming* and *The Triunity of Matter, Force and Mind*, gave occasion for an interesting correspondence which revealed the lively attention which, in advanced life, he paid to the highest function of man.

Macnamara was a tall, handsome man, with fine features and a very pleasant manner. He was endowed with a strong physique and a sound, well-trained and exercised intellect, which he devoted with sustained energy to useful and practical purposes. He was ambitious, but his ambition did not transcend his capacities. He was a man of deep religious convictions and kindly disposition, a loyal friend, an affectionate relative, and a devoted husband and father. He was twice married. His first wife was a Miss Furlong, daughter of an indigo planter; she died shortly after her marriage. His second wife was a Miss Bayley, daughter of Mr. Justice Henry Bayley, of the Calcutta High Court. She was the mother of eight children—two sons and six daughters.

The eldest son, Lieutenant-Colonel Carrol C. Macnamara, was killed in France in July, 1916, while leading the 1st battalion of the Royal Irish Rifles in the battle of the Somme. He had a very distinguished career in South Africa, China, the Sudan and Gallipoli, and was known as an officer of great bravery and merit. His second son, Patrick, is a very rising officer in the Royal Navy. Of his six daughters, five made good marriages, and the youngest had kept house for her father since the death, a few years ago, of his wife, who was a very competent and affectionate wife and mother.

II

KALA-AZAR IN ASSAM.

MAJOR T. C. McCOMBIE YOUNG, I.M.S., the Sanitary Commissioner for Assam, has published a report on the work of the kala-azar survey during the season 1917-18 as a supplement to his Sanitary Report for 1917, from which we make the following extracts. A sketch is given of the ravages of the disease in Assam, and especially in Nowgong district, during an epidemic cycle of twenty years.

In 1914 the report of a survey was as follows:—

The disease is now rare in Sylhet, has greatly diminished since 1903, and is present in only a few endemic foci where the disease is of chronic type, with little tendency to spread.

In the Garo Hills there is little infection, although in a few isolated villages here and there, occasional cases may be found.

In Goalpara district, the Dhubri subdivision is practically free of infection, but in the Goalpara subdivision a fairly active endemic centre was discovered in the Dudnai thana, where 25 infected villages have been discovered.

In Kamrup a number of scattered endemic foci have been discovered, 14 infected villages being reported from the Gauhati subdivision, some with a fair number of cases. The Barpeta subdivision is practically free, and North Kamrup contains some 36 slightly infected villages.

In Tezpur subdivision the disease has practically died out, but in Mangaldai a number of infected villages were discovered.

In Nowgong 86 infected villages were discovered, and the type of case seen is more acute, and the number of cases per village greater than elsewhere.

In the Golaghat subdivision 8 villages were found to be infected.

It was noted that the people themselves were of opinion that the disease has begun to increase of late years.

No survey was carried out in the Upper Assam Valley, but careful enquiries elicited the information that no kala-azar infection was known to exist east of the Kakodonga river in the Jorhat or Sibsagar subdivisions, or in the Lakhimpur district. The medical and vaccination staffs of these districts were asked to exercise vigilance to detect the presence of kala-azar in this previously uninfected area, and to bring to the notice of the Civil Surgeon and the Sanitary Commissioner any suspicious cases that might come to light.

It is noteworthy that in 1914 the limits of the area infected was identical with those described by Sir Leonard Rogers in 1896-97.

Since then evidence has accumulated of a further spread of the disease. The Survey Report of 1917-18 states as follows:—

A table of statistics has been prepared by Assistant Surgeon S. C. Majumdar from the information recorded by the Sub-Assistant Surgeons in the course of their work.

The interesting points in the table are as follows:—

(1) *The sex incidence.*—Out of 360 cases, 66·9 per cent. of the cases seen were males, and 33 per cent. females. In the 1912-13 and 1913-14 survey 68·8 per cent. of 795 cases seen were also males.

(2) *Age incidence.*—Only 33·6 per cent. of the cases seen were over 20 years of age, as against 23·4 per cent. in our original survey.

It is worth noting that we never see a case in the person of an infant under one year of age. It is rare also to see a case in a really old person, and the sole survivor of a family which has been wiped out by *kala-azar* is often the old grandmother.

(3) *Previous history*—53·3 per cent. of the cases gave a history of cases of a similar disease having occurred in the family, in spite of the fact that in a number of villages the disease had recently appeared.

In making a rough diagnosis in village work, we rely greatly on the confirmation afforded in an early case with doubtful clinical appearance by the history of previous cases in the family.

Occupation.—The cultivator class is the one affected, and the analysis of cases by caste does not present any significant features.

Naga Hills.—It was suggested by Mr. Hutton, the Deputy Commissioner of the Naga Hills, in conversation with the Hon'ble Colonel H. E. Banatvala, C.S.I., I.M.S., Inspector-General of Civil Hospitals, Assam, that *kala-azar* was present in the submontane tracts of the Naga Hills, and at the *Kala-azar* Conference it was decided that this area also should receive attention. A list of likely villages was received from Mr. Hutton and Assistant Surgeon S. C. Majumdar and myself halted from 23rd to 30th November at Dimapur as a convenient centre on a motoring road. We visited several of the Naga villages mentioned by Mr. Hutton, and made other inquiries to ascertain if *kala-azar* exists in that neighbourhood. In the course of the inquiry we visited Meziphima, Ferima and Samaguting, interviewed and questioned closely the gaonbura of Rozeophima, and obtained information from the neighbouring mauzadars. From our observations in regard to other villages, it would appear that the first two mentioned villages are very highly malarious, 8 out of 10 children examined in Meziphima, and 9 out of 11 examined in Ferima, had enlarged spleens, and many of the adults evidently suffer frequently from malaria. In Meziphima we found a woman with an enormously enlarged spleen and other symptoms suspicious of very chronic *kala-azar*. She gave a history of having contracted the disease five years ago when living in Nowgong. This may be a chronic case of *kala-azar*, and two of her relatives show symptoms of what may either be chronic malaria or chronic *kala-azar*. The future history of this village should be watched. All these villages give the history of having been more populous forty or fifty years ago and of many families having died out. The account in all of them is of the occurrence of an acute disease usually of short duration, never more than a month, and not showing any special family incidence.

The disease which has depopulated these villages is in all probability malaria, and some adverse change in the economic condition of life, such as restrictions in forest rights, or other causes which only those intimately acquainted with the conditions of village life could detail, has led to a deterioration in the vitality of the community. Perhaps, also, the introduction through increase of communications, of a more malignant type

of malarial parasite, has played a part, although this is of course highly conjectural.

Samaguting, which was formerly a military outpost, has also decreased in size, but the people look in better physical condition than those of Meziphima and Ferima. The splenic index here is also somewhat lower. Out of 32 children examined, twenty showed enlarged spleens. The gaonbura of Rozeophima gave an account of his village and the prevalent complaint in it which seemed to indicate that no disease resembling *kala-azar* exists in it.

We interviewed the mauzadar of Nishungard and obtained from him a history of the causes of deaths in the villages in his jurisdiction. Again no suspicion of *kala-azar* was raised in our minds from his account of the causes of mortality in these villages. My conclusion is that in so far as I can judge, *kala-azar* is not at present to be found either in epidemic or endemic form in this area, although possibly a few sporadic cases such as that seen in Meziphima may be present, the infection having been acquired elsewhere. There does not appear to be any general and widespread *kala-azar* infection, but those villages are certainly highly malarious, and the acuteness of the malaria infection seems sufficient to have raised the suspicion of the presence of *kala-azar*.

Whether any infection exists in more remote villages which we did not visit, is for consideration. It seems to me rather unlikely, as these villages are small, very remote and not sufficiently open to free intercourse with infected areas to render their infection in any degree probable.

It was decided at the conference that all tea estates in the Sibsagar district should be examined to ascertain if *kala-azar* was present in the labour force. It was arranged that this portion of the survey should be performed by medical officers of the tea industry under the general supervision of the Civil Surgeon, Sibsagar, and during the cold weather, the medical officers of the tea industry were at work examining the labour forces of tea estates. In June 1918, Lieutenant-Colonel Macleod, I.M.S., reported that 156 gardens with a total population of 207,857 persons had been examined, of whom the numbers not actually seen were 6,982 or 3·3 per cent. and that six gardens still remained to be surveyed which he thought might safely stand over till next cold weather. One or two suspicious cases were observed, but further observation showed these to be of malarial origin and it is satisfactory, therefore, to be able to record that, with the exception of Duria, where exceedingly efficient measures of control have been put in force, the labour force of the tea industry in the Sibsagar, Jorhat and Golaghat subdivisions is free from *kala-azar*.

Lieutenant-Colonel Macleod in forwarding his report gratefully acknowledges the "whole-hearted manner in which visiting medical officers have co-operated in carrying out in addition to their ordinary work these surveys." He also suggests that "the assistance given by the Superintendents and Managers of the various estates in arranging musters necessary to the efficient carrying out of these surveys should receive recognition, as apart from the trouble and inconvenience caused by the musters, the withdrawal of the labour force from their work entails a certain loss."

RECOMMENDATIONS.

I would recommend that our present work be carried out on the following policy:—

(1) Close observation of the behaviour of the disease throughout the plains districts of the Assam Valley, both in the villages and on tea gardens.

(2) Removal and notification of acutely infected villages in the endemic areas, and of all infected villages in the Sibsagar district.

(3) Extension of facilities for effective treatment.

I propose to employ our staff of Sub-Assistant Surgeons in the coming touring season in the following.

plan. First of all, it is clear that our assumption in connection with the first survey that kala-azar did not exist in the Upper Assam Valley was fallacious. We ought now to ascertain what is doing in Lakhimpur as well as in Sibsagar, for we have no guarantee that kala-azar will not break out there also, and it would be bad policy to wait until some village gets as badly infected as Kopohua and Reoti before we begin to take action.

I therefore propose to assign to two Sub-Assistant Surgeons the survey of the Dibrugarh and North Lakhimpur subdivisions, and the Civil Surgeon, Lieutenant-Colonel Macleod, may be asked to conduct a survey of tea estates similar to that which he supervised in Sibsagar last year. In Sibsagar two men will be posted, one in residence at the dispensary we are building there, to assist the Assistant Surgeon in charge, to act as a reserve to take the place of any of the others going sick, and for a spell of experience of intravenous treatment under the Assistant Surgeon who is being specially trained in this work. The second man will be in charge of the notified and suspected villages of the subdivision, which he will frequently visit; he will also examine and report on any other villages reported to be infected, and generally keep his eyes and ears open for any signs of kala-azar infection. In Jorhat, I propose to post a man at Kakodonga in the old rest-house which has kindly been made over to us by the Chairman of the Local Board. This will form convenient headquarters for the supervision of Chungi, and of the adjoining village of Malia-gaon which may be assigned to him, and for housing a dispensary for the intravenous treatment of cases from the adjoining villages. He will also visit and report on suspected villages in the Jorhat subdivision. In Golaghat, our dispensary at Naharani and existing arrangements will be maintained. In Nowgong, I propose to post a Sub-Assistant Surgeon in the neighbourhood of Kathiatali. An area of land will have to be acquired for a dispensary, and kutchha buildings to house the Sub-Assistant Surgeon, his dispensary, and, if possible, some patients, should be erected. His duties will be, as elsewhere, the supervision of notified and segregated villages and the investigation of other reported infections. The Kachari mahals of Mangaldai need attention, and a Sub-Assistant Surgeon should be posted to this area and provided with temporary quarters and a dispensary somewhere in the infected area, the exact locality of which I have not yet decided. The endemic areas in Goalpara must be resurveyed, and a dispensary with a temporary residence for the Sub-Assistant Surgeon should be established here later on. Similarly on the completion of the survey of Lakhimpur, one of the Sub-Assistant Surgeons working there should be posted to Kamrup in some convenient centre.

The term dispensary sounds formidable, but all that is meant is the provision of a habitable *basha* for the residence of the Sub-Assistant Surgeon, a convenient room to hold drugs, instruments, and for the administration of intravenous injections, and out-houses for his servants. We should have some available land on which to run up a few *bashas* for resident patients, a few of whom might be induced to "live in" for three months of treatment.

During the touring season, the Sub-Assistant Surgeon would have little opportunity for treatment, but for almost half the year, rain and mud make touring impossible, and during this time, treatment could be pushed. Most of our present men have already had some experience of this work, and their training can be completed at Nazira or in Shillong.

Our policy of the notification of infected villages and their removal to fresh sites should be continued, and it would be well if the provisions of the Epidemic Diseases Act be put permanently in operation, following the precedent created in regard to plague. In the endemic areas, badly infected villages should be dealt with, and Nowgong needs special attention in this respect, as there are in certain areas badly infected villages in which the

mortality is considerable, and it is necessary, if the disease is to be held in check and the disquieting upward trend of the district kala-azar mortality is to be controlled, that more money than we have hitherto expended on such measures in Nowgong should be available.

Similar treatment should be accorded to badly infected villages in Mangaldai, Kamrup, and Goalpara, after investigation of the information we received from our district staff, and from the district officials.

In the Sibsagar district we should aim at the removal of every infected family that we can discover, and of the contact families, to fresh uninfected sites. The economic importance of the Upper Assam Valley is great and money judiciously spent in protecting it from an epidemic invasion or an endemic settlement of kala-azar, is money well spent.

As may be gathered from a perusal of section of this report which deals with the conditions in each infected area and with the action taken on my recommendations, our organisation is unsatisfactory in the long interval that elapses between the discovery of the infection by the Sanitary Department and the carrying out of our recommendations by the district authorities, and our work is therefore much less efficient than it might be. A perusal of the notes showing the conditions in each infected area, and the action taken on the recommendations, will show the urgent need for a better system. For instance, in Mangaldai much of the survey will have to be repeated owing to the fact that nothing will be done in most of these villages till next cold weather. Owing to the delay that occurred in the removal operations at Kopohua and Reoti, a considerable extension of the infection occurred. In Koamara Handiquai and in Maotgaon fresh cases have occurred in persons who would have been removed as contacts and would, in all probability, have escaped the disease, and in Soruka-charigaon, the bulk of the work has yet to be done.

One appreciates the difficulties attending these removals, which involve a search for suitable sites and the construction of new houses where hired labour is not available and when the villagers are apathetic and obstructive, but one earnestly hopes that improved methods can be devised, whereby the district administrations concerned will be able to push these operations through with greater celerity.

TREATMENT.

Plans for a small hospital in connection with the Pasteur and Research Institute in Shillong where useful work has already been done, have been approved by Government. The plans for indoor hospital situated near the infected centres in the Sibsagar subdivision have also been approved and the preliminary work is in hand. An Assistant Surgeon has been selected for the work and is at present under special training. Increased facilities for treatment may also be provided by organising smaller and less ambitious subsidiary dispensaries in the infected areas as already suggested, and it may reasonably be hoped that this portion of the work will in time bear fruit.

The Assamese whose past experience of the futility of medical science in dealing with the disease has been discouraging, have yet to learn the value of the remedy we are offering. Considerable faith is required in ignorant villagers to enable them to persevere with a course of treatment by unfamiliar methods involving a period of three months' attendance, and it will take some time before the number of patients we shall be able to treat will be considerable.

It is however clearly our duty to place the opportunity for treatment at their disposal, and we may fairly hope that we shall eventually succeed by success.

In conclusion, I would commend to the favourable notice of Government the valuable services of Assistant Surgeon S. C. Mazumdar. His experience of the detection and control of the disease is large, his assistance in the control of the staff, and in the details of the survey

has been most valuable, and his energy and cheerfulness in arduous duties has been unflinching.

The Sub-Assistant Surgeons who deserve favourable mention for good work are the following:—

Sreejutt Hemchandra Barua,

" P. K. Barua.

Babu J. C. Banerjee,

" B. K. Ghose,

" A. R. Mukerjee, and

" G. K. Mazumdar.

Correspondence.

WASSERMANN TECHNIQUE.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—Where many Wassermann reactions have to be done, as at a venereal hospital, the technique of measuring reagents by means of graduated pipettes may be found somewhat tedious and long. The technique I am about to describe will be found simple, quick and accurate.

Draw out some thick, strong glass tubing into pipettes, and measure the capillary ends through a wire gauge, cutting them off so that the cut ends are all equal in area. These pipettes will deliver drops of equal size of the same fluid at the same rate of flow. The drop I use is $1/35$ of one c.c. at one drop per second, but any size may be taken within limits. They can be tested by attaching them to the end of a c.c. burette and counting the number of drops to the c.c., the flow being controlled through a bead valve, as described later.

Teats for these pipettes can be made by cutting off an inch or so of rubber tubing, sandpapering out one end with a cone of sandpaper and sealing with rubber solution; or putting in a piece of glass rod or a bead at one end. A plentiful supply of these tubes should be kept as one is needed for each serum to be tested, and of which there may be forty or fifty in a batch. The pipettes so made only need to take up about $\frac{1}{2}$ c.c., and the total length is about 2". They should be strong so that the ends do not get chipped. One pipette for each serum obviates the risk of contamination of one serum by another and saves the trouble of washing out pipettes.

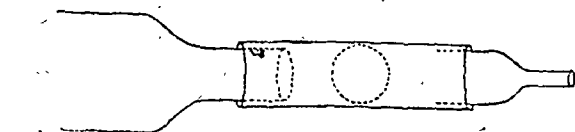


Reservoirs can be made, for adding sensitized cells, complements, antigen and saline, as follows:—

Take about 8 inches of $\frac{1}{4}$ -inch glass tubing and draw out to about half its diameter at one end.



To this attach an inch of rubber tubing containing a snugly fitting glass bead. Into the other end of the rubber tubing insert a pipette cut off to deliver the standard drop.



The following points are to be noted:—

The pipette that gives 35 drops of saline gives 40 of serum and 45 of alcoholic antigen cholesterol dilution. The pipette to be used for these must therefore be found by experiment, attaching it to the end of a burette and selecting the size which gives 35 drops to the c.c.

The method I follow is broadly that of Harrison with 5 M. H. D. and 3 M. H. D. complement tubes and one control tube.

Into all control tubes measure 7 drops saline from the saline reservoir. Take up a few drops of serum No. 1 with one of the small pipettes and add two drops into the first control tube. This gives a dilution of 1-5. Empty the

pipette of the remaining serum and fill with the dilution in control tube. Put two drops of the dilution into each of the three tubes of No. 1 serum test and repeat with the remaining sera, using a different pipette each time.

Complement 5 M. H. D. and 3 M. H. D. are put into the reservoirs, and by slightly pressing the rubber tubing over the bead between the finger and thumb of one hand, while the other holds the reservoir vertical, drops can be added to the rows of tubes very quickly. The same method is adopted for adding antigen and sensitized cells. I use a different reservoir for each reagent. The unit I use is a 2-drop one so that the antigen tubes contain 2 drops diluted serum, 2 drops antigen, 2 drops complement and 2 drops cells.

I do not propose to amplify the above as it is not a description of the Wassermann test but merely a note on technique which I have found to be useful and which may be so to others who have large numbers of sera to deal with.

Yours, etc.,

KARACHI:

February, 1919.

F. I. JAMES,

Major, I. M. S.

A CASE OF MALIGNANT TERTIAN MALARIA WITH PURPURIC HÆMORRHAGES.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—I bring this case to the notice of your readers, such being rare and seldom recorded. Also as a reminder, of how protean this disease is in its manifestation and of the value of a blood examination in all cases of pyrexia of a doubtful nature, where there may have been the slightest exposure to infection, so as to avert erroneous diagnosis, as happened in this case.

The patient, a Maori private, of the New Zealand Force in Palestine, was admitted during a rush diagnosed as measles, with no record of a blood examination having been made. It might be noted here that though this wrong diagnosis was made, in its early stages the case may have presented the skin appearances of measles, which is also of importance, hence probably this diagnosis. At Haifa I saw two cases of M. T. malaria ushered in with a papulo-erythematous rash, but there was no resemblance to measles. The hamaturia which occurred—to be mentioned later—must have come on after or else passed unnoticed.

The case must have taken a few days travelling to get to us and on arrival presented the typical icteric tinge of the skin and conjunctivæ, with the addition of purpuric hæmorrhages (petechiæ as well as small areas of mottling all over the body and limbs. The conjunctivæ showed large blood-shot patches, resembling those seen a few days after a bad contusion. The hard palate, buccal mucous membrane and gums had small petechiæ and occasional larger mottled areas. The same condition was present in the nasal mucous membrane, which also bled frequently. Before we reached his other symptoms and the result of the blood examination, the above hæmorrhages, as may well be imagined, were most misleading at first sight. The liver and spleen were slightly enlarged and tender. Large quantities of urine were passed consisting almost of pure blood. This condition gave us the most anxiety, as it continued for five days in spite of vigorous treatment, but after the sixth or seventh day it gradually subsided. Much pain was complained of about region of kidneys, and judging from the amount of blood passed, there must have been intensive erosions present. Bowels were not moved till the fifth day after admission, when there was a very large exceedingly black, constipated stool, after a dose of ol. ricini. A similar one followed this after two days, and then they gradually resumed a normal colour. There was no bilious vomiting. As regards the skin hæmorrhages, a few fresh steps were noticed to appear about the chest on the second day after admission, but no more followed. These first hæmorrhages were flush with the skin, as were the ones on the patient the day of admission, but of course newer in colour. The blood examination showed a heavy infection with M. T. rings on the first day, these soon got scanty after treatment and on the ninth day a very occasional crescent was only to be seen; and the latter were not seen on subsequent examinations up to the time patient was transferred. Quin. bihydrochlor., gr. x, was given by mouth thrice daily, well diluted, and was kept down. The intramuscular route was not adopted as it was thought that the tissue would not stand it. The patient though not a strong subject stood these hæmorrhages exceedingly well. Recovery was rapid once the hamaturia ceased, and patient was on his feet by commencement of fourth week, after which he was evacuated down the line.

A hæmorrhagic diathesis was considered as a probable cause of this particular patient's symptoms, but there was no

such history. This is only from a mental note of the case, and I regret not being able to give fuller details.

Yours, etc.,

A. R. D'ABREU,
Assistant-Surgeon, I. M. D.

INFLUENZA.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—May I request the hospitality of your paper to bring the following fact to the notice of the medical profession regarding the much vexed question of isolating the pathogenic organism during the present influenza epidemic.

Numerous attempts have been made to isolate and identify the Pfeiffer's bacillus from the sputum, nasal secretion, blood, urine and stool of patients suffering from the disease; but so far they have not been very successful. Even by making post-mortem examination on influenza cases, I failed to detect the organism in any internal organs. These failures led me to examine the various recesses communicating with the nasal cavity,—as the antrums of Highmore, frontal and ethmoidal sinuses and mastoid antrums. The cavities were filled with mucoid substance with yellowish lumps embedded in it. The lumps, on examination, were found to consist of pure growth of bacilli, which in microscopical, morphological, staining and cultural characters are identical with Pfeiffer's bacillus. The bacilli grew well in all media.

It appears that the bacilli have special selection for the above recesses, wherein they grow and multiply and liberate their toxin from those places to the system.

My best thanks are due to Lieutenant-Colonel Hall, Surgeon-Superintendent, and the staff of the S. N. P. Hospital for giving me kind permission and every facility in my work; and to Lieutenant-Colonel Brown for the valuable advice and encouragement received from him.

Yours, etc.,

CALCUTTA : DEBENDRANATH SEN, L.M.S.,
January, 1919. Pathologist, Sambhu Nath Pandit Hospl.

THE TREATMENT OF INFLUENZA IN INDIA.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—To lower the high rate of mortality which has accompanied the recent epidemic of influenza, it is necessary to minimise the effects of the toxins upon the heart and lungs, and fortify these organs against the attacking forces.

It is better to be pessimistic and anticipate complications than treat them when they appear, just as an experienced motorist prepares for a steep incline or decline by accelerating or reducing his speed before arriving at a hill.

The first essential in cases of influenza is absolute rest from the commencement of the disease, and many fatal cases have a history of having continued their usual avocations when suffering from fever and general malaise.

Knowing the frequency and danger of heart failure in influenza, it is for each medical man to decide whether it be better to anticipate this complication or wait until mitral incompetence ensues.

It is futile to bolt the stable door when the horse has run away, and many fatal cases could be prevented if cardiac stimulants were given in adequate doses at the commencement of treatment.

Although it has been found experimentally that drugs of the digitalis group have no effect on the cardiac muscle in febrile cases, they certainly act through the medullary centres. In extreme cases, musk and camphor are of great service. But of far greater importance than the administration of cardiac stimulants is the avoidance of cardiac depressors; and cachets of aspirin, phenalgin and caffeine, though they reduce the fever and alleviate the pains, undoubtedly depress the heart and render it less able to resist the toxins eliminated in the course of the disease.

Should the pains be severe enough to cause restlessness, insomnia, or an undue apprehension of danger, an injection of scopolamine and morphia will be of benefit to the patient.

A too drastic aperient should be avoided on account of the strain on the heart, and it is better to rely on enemata or purgatives of not too violent a nature.

A large enema may with advantage be followed by a rectal injection of glucose.

No food of any description should be allowed until the fever has abated, and the old idea of "keeping the strength up," by piling in nourishment, is exploded. Imperial drink, not only as a thirst quencher, but as a diuretic and eliminator of toxins, is of great value.

In spite of the teaching of the late Sir Victor Horsley and his disciples, there can be little doubt that alcohol, given in proper doses, often helps a tired and failing heart to clear the fence, just as the whip or spur often decides a race.

A simple acid tonic mixture, on account of its decalcifying effect on the blood, should be given.

The chest should be rubbed twice a day, with some rubefacient, to promote peripheral circulation.

Should the patient develop pneumonia in spite of all precautions, he should be made to sit up for four hours each day in an arm-chair.

The advantage of relieving the right-heart by venesection should not be overlooked, and the operation is not practised enough. I have seen no good results follow the use of either autogenous or phylacogen vaccines in these cases.

Yours, etc.,

BRITISH STATION
HOSPL., CALCUTTA :
January, 1919.

CECIL WEBB-JOHNSON,
Captain, R.A.M.C.

SECOND ATTACK OF ECLAMPSIA.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—Will you or any of the readers of your valuable paper kindly throw some light (through *The Indian Medical Gazette*) on the following points :

Whether a patient who has had a severe attack of eclampsia during her last pregnancy, but whose urine was completely freed of all albumen (and has remained free for more than a year), runs the risk of a second attack during her next pregnancy? If Yes, what is the probable extent of the risk and whether any prophylactic means (short of prevention of conception) can be adopted to prevent the attack?

I have tried to look up the points in our literature but cannot come across any definite opinions on them.

SHIKARPUR, SIND :
27th December, 1918.

Yours, etc.,

B. J. DAVIDSAMI, M.B., B.S.

[Will some reader oblige?—ED., I. M. G.]

INTESTINAL COLIC.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—Some forms of intestinal colic are so severe that the physician himself is puzzled in choosing medicines. Leaving aside cases of lead poisoning, as well as those of renal and biliary colics, we remember cases of the ordinary kind, arising simply from ingestion of indigestible and irritating foods, often turn very obstinate and unamenable to treatment. The first cause in many of the cases is this. Whenever we understand the cause of the colic is one of indigestible food, we no longer hesitate to prescribe a purgative, in order to get rid of such articles from the digestive system. Some purgation may follow, but resulting with a pain of a very gripping nature on account of further irritation of the intestines due to the administration of such purgatives, and which takes much time to be subdued. The second cause is: the indigestible ingesta when they fall into the stomach irritate the stomach, producing pain, and when passing down and down irritate gradually all the segments of the alimentary system and thereby produce colic, indigestions, tenderness, costiveness or diarrhoea and so forth. The third cause is neglecting the attack, which may produce or threaten peritonitis, intestinal obstruction, strangulation, appendicitis, etc.

Hence our main point in treating these cases is to soothe the system after getting rid of the irritable ingesta. The question arises, how is it possible to soothe the system after evacuation of the bowels, since it must be attempted by some form of purgative or other unless the whole system is not at all washed out.

I remember one case which I treated recently and which will help readers in solving the problem.

A gentleman fell ill of intestinal colic and I being absent from my headquarters my compounder was called for. The compounder prescribed a dose of magnesium sulphate, 3iv, with some hot water. Bowels failed to be moved by that. Next day he administered another dose of mag. sulph. 3vi, with hot water. Some 5 or 6 hours passed, the bowels were not moved. Instead the colic grew intense and the patient asked for immediate relief. My compounder then applied some dry cuppings over the abdomen, with momentary relief. After a few hours the patient felt fullness of the abdomen with intense colic and tenderness. I reached headquarters at the time and was called to see him. On examination, I noticed the following symptoms: profound restlessness, temperature normal, no appetite, tongue furred, patient presses his abdomen to get some relief, pains in paroxysms, i.e., spasmodic, bowels costive, etc. Before administering any medicine I desired to try hot fomentation on the abdomen, but the patient refused, saying he himself had tried it

and it only caused the colic to become more intense than before. I therefore gave a soap-water enema, of about 3 pints, with 2 oz. of castor oil. The bowels moved, but with not a trace of faecal matter. I suspected intussusception, strangulation or obstruction of the bowels, but hesitated to express such a conclusion because stercoraceous vomiting was not present.

Thereafter I applied a mustard plaster, 8" x 6" x 1/8", on the tendermost part and watched the patient. Some half an hour passed, during which the patient told me that he felt some sort of "fighting" going on with the internal colic and the external application. A few minutes after, he cried to take the plaster off, which I did. By that time he had a call of nature and walked out to the privy. He came back after a while and told me that he had a copious evacuation of faecal matter. The burning sensation continued for about an hour more and then the colic subsided. Next morning he complained of nothing but some "rough" sensation on the part where plaster had been applied.

I told him to apply some coconut oil to the part, and prescribed the following, and which was continued for a week:—

R	Sodi bicarb.	...	...	gr. xx
	Tinct. card. co.	...	...	3ss.
	" ginger	...	...	m xv
	" nux vom.	...	...	m iv
	Aqua anethi	...	...	ad 3i

M. ft. Mixt. for a dose. Each to be taken thrice daily. No further complaint had since been had from the patient.

Yours, etc.,

KARANJIA DISPY.,
MAYURBHANJ STATE :
12th November, 1918.

SUKES LOBHON SEN, L.M.P.,
Sub-Assistant Surgeon.

Service Notes.

Though the armistice was started on November 11th and fighting then came to an end, at least for the time being, lists of casualties still continue to be published, though the numbers are now small. Missing men are gradually being accounted for either as killed or prisoners, and a few belated casualties are still being reported; while the number of deaths from disease remains very high, owing to the influenza epidemic. During the fourteen days, 5th to 17th December, 1918, inclusive, the total number of casualties, among officers reported, was 531, which may be tabulated as follows:—

Killed	...	...	...	183
Died	...	...	...	155
Wounded	...	...	...	111
Missing	...	...	...	12
Prisoners	...	...	...	70
TOTAL				531

The number of casualties among medical officers reported was nineteen, all deaths from disease, and most, if not all, from influenza. The names are given below. All, not otherwise noted, are temporary officers of the R.A.M.C.

Died.—Lieutenant-Colonels M. A. T. Collie (I.M.S., retired), H. G. Melville, C.I.E. (I.M.S.); Majors A. V. Ford (T.F.), R. S. Armour; Captains D. Cotterill, B. M. Brander (T.F.), W. H. Compton, G. E. Keith, D. P. Lindsay, J. Donaldson, N. K. Foster, O. D. Price (S.R.), L. Das (I.M.S., temporary), J. M. Gage, F. M. Hewson (regular, R.A.M.C.), W. R. O'Keeffe, Dr. R. P. Cockin, (late temporary Captain, R.A.M.C.); Surgeon-Lieutenant M. E. Jones (R.N., temporary); Asst. Surgeon H. A. Fox, D.C.M. (I.M.D.) and Sister A. H. C. Dagg (Canadians).

Lieutenant-Colonel Mackintosh Alexander Thomas Collie, Bombay Medical Service (retired), died at the Victoria Park Hotel, Barrow-in-Furness, of pneumonia after influenza, on 3rd December, 1918, aged 62. He was educated at the University of Aberdeen, where he graduated as M.B. and C.M. in 1881, after taking the L.R.C.S. and P. (Edin.) in 1878. Entering the I.M.S. as Surgeon on 31st March, 1883, he became Surgeon-Major on 31st March, 1895, and Lieutenant-Colonel on 31st March, 1905, retiring on 30th June, 1913. He was appointed Secretary to the Surgeon-General, Bombay, in March, 1888, and in December, 1892, Resident Surgeon in the St. George's Hospital, Bombay, and Professor in the Grant Medical College, Bombay. From October, 1895, to the end of 1902, he served in various Civil Surgeoncies; in January, 1903, he was appointed a Presidency Surgeon, Bombay, and in November, 1905, Physician to St. George's Hospital, Bombay, holding that post till his retirement.

He rejoined for service in the present war on 20th October, 1914, and served for some time on a hospital ship; in 1915 he served in the Indian hospitals, first at Brokenhurst, and later in the Pavilion at Brighton. In the early part of 1916, he was for some time in charge of a military hospital at Malta, and was afterwards appointed President of No. 3 Recruiting Medical Board at Manchester. While acting as President of a Colliery Recruiting Board in February, 1917, he contracted a severe attack of pneumonia, which nearly proved fatal and from which it is probable that he never fully recovered. On rejoining duty he was posted to the command of the military hospital at Barrow-in-Furness and held that post till his death.

Major Shadworth O. Beasley, of the Medical Corps, United States Army Reserve, was killed in action in France on 14th October, 1918, while attached to the 76th Field Artillery. He was the son of the late Edward Calvert Beasley, of Sansalito, Marin County, California.

Captain, Denis Cotterill, R.A.M.C., died of influenza on 2nd December, 1918, in No. 50 Casualty Clearing Station in France. He was the eldest son of Mr. J. M. Cotterill, C.M.G., F.R.C.S., of Edinburgh, and was educated at the University in that city, where he graduated as M.B. and Ch.B. in 1906, also taking the F.R.C.S. (Edin.) in 1910. After acting as Clinical Assistant and House Surgeon at the Edinburgh Royal Infirmary, he went into practice in Edinburgh, and was appointed Assistant Surgeon to the Infirmary. He took a temporary commission as Lieutenant in the R.A.M.C. on 9th July, 1917, and was promoted to Captain after a year's service.

Captain William Robert O'Keeffe, R.A.M.C., was reported as having died on service, in the casualty list published on 5th December, 1918. He was educated at Queen's College, Cork, and in the Medical School of the R. C. S. I. in Dublin, and took the L.R.C.S. and P.I. in 1912, after which he went into practice at Sheffield. He took a temporary commission as Lieutenant in the R. A. M. C. on 10th May, 1917, and was promoted to Captain after a year's service.

Captain Bruce M. Brander, R.A.M.C. (T.F.), died in France of influenza on 30th November, 1918. He was the only son of Joseph Brander, of Aberdeen, and held a commission in the R. A. M. C. (T.F.), as Captain in the 1st City of London Sanitary Company.

Captain William Henry Compton, R.A.M.C., died at Richmond Military Hospital of pneumonia on 6th December, 1918, aged 57. He was educated at Charing Cross Hospital, and took the L. S. A. in 1886. After serving as Surgeon in the Royal West Indian Mail Steamship Company, and as Medical Officer in charge of the Hospital and Quarantine Ship H. M. S. *Edgar*, he went into practice at Brighton. He took a temporary commission as Lieutenant in the R. A. M. C. on 1st July, 1915, and was promoted to Captain after a year's service.

Captain Norman Kessen Foster, R.A.M.C., died on board the Hospital Ship *Amara* on 2nd December, 1918. He was the younger son of Edward A. Foster, I.S.O., of Oxford, was educated at University College, London, and graduated as M.B. and B.S. (Lond.) in 1908. He took a temporary commission as Lieutenant in the R. A. M. C. on 2nd July, 1917, and was promoted to Captain on completion of a year's service.

Captain George Elphinstone Keith, R.A.M.C. died in the 62nd General Hospital, Italy, of influenza, on 6th December, 1918, aged 54. He was the son of the late Dr. Thomas Keith, and was educated at Edinburgh University, where he graduated as M.B. and C.M. in 1887. After acting as House Surgeon to the Women's Hospital, New York, and as Assistant to the Professor of Clinical Surgery at Edinburgh, he went into practice in London. He took a temporary commission as Lieutenant in the R. A. M. C. on 31st July, 1915, and was promoted to Captain after a year's service. He was joint author, with Mr. Skene Keith, of "A Text-book of Abdominal Surgery," and of "Cancer: Relief of Pain and Possible Cure"; and was for some years Secretary of the British Gynaecological Society.

Colonel Harry George Melville, C.I.E., Bengal Medical Service, died at Baghdad on 7th December, 1918, aged 49. He was born on 24th March, 1869, the son of the late Francis Luther Melville, of Edinburgh, and educated at Edinburgh University, where he graduated as M.B. and C.M. in 1890, and as M.D. in 1906, also taking the F. R. C. S. (Edin.), in 1900. After serving as Demonstrator of Anatomy in the University, and as Resident Physician in the Royal Infirmary, Edinburgh, he entered the I. M. S. as Surgeon-Lieutenant on 27th July, 1892, and became Surgeon-Captain on 27th July, 1895, Major on 27th July, 1904, and Lieutenant-Colonel on 27th July, 1912. He held the temporary rank of Colonel while serving as Consulting Physician to the Mesopotamian Expeditionary Force. After serving for some years as Medical Officer of the 5th Punjab Cavalry (now the 25th Cavalry, Frontier Force), he was appointed Professor of Anatomy in Lahore University in April, 1899, and in April, 1903, became Professor of Materia Medica, and Second Physician to the Mayo Hospital, Lahore. Prior to the great

war he had seen much service in the North-West Frontier of India: the Waziristan campaign of 1894-95, including the action at Wana (medal and clasp), the Mohmand campaign of 1897-98 (medal and clasp), and the Tirah campaign of 1897-98, with the operations in the Bara Valley (clasp). He had received the C. I. E. for services during the war, on 26th August, 1918.

Captain James Donaldson, R.A.M.C., died at the Military Hospital at Ras-el-Tin, Egypt, on 5th December, 1918. He was the son of the late James Donaldson, schoolmaster, of Dundee, and was educated at the Universities of St. Andrews, where he graduated as M. A. in 1899, and of Edinburgh, where he took the M. B. and Ch.B. in 1903, after which he acted as Clinical Assistant at the Royal London Ophthalmic Hospital, and at the Throat Hospital in Gray's Inn Road. He took a temporary commission as Lieutenant in the R. A. M. C. on 13th July, 1917, and was promoted to Captain after a year's service.

Captain David Paton Lindsay, R.A.M.C., died at Dar-es-Salam, East Africa, on 2nd December, 1918. He was the second son of Ninian Lindsay, of Uphall, and was educated at Edinburgh, where he graduated as M.B. and Ch.B. in 1912, after which he went into practice at Wreken-ton, Gateshead-on-Tyne. He took a temporary commission as Lieutenant in the R. A. M. C. on 5th June, 1917, and was promoted to Captain after a year's service.

Dr. Reginald Percy Cockin (late Captain, R. A. M. C.), died at West Kensington, on 9th December, 1918, aged 39. He was the son of the late John Cockin, of the Park Hall, and was educated at the London Hospital, and at Gonville and Cains College, Cambridge, where he graduated as M.A., M.B., and B.C., in 1906, and as M.D. in 1913. After acting as Casualty House Surgeon of Hull Royal Infirmary, he entered the West African medical staff, where he served as Medical Officer of Okigwi, in South Nigeria, and as Medical Officer of the Niger Cross River Expedition in 1908-1909. In 1910 he joined the Colonial Service in Cyprus, where he was a District Medical Officer and Examiner under the Pharmacy Law. In 1913 he was transferred to Grenada, West Indies, where he held the posts of Resident Surgeon to the Colony and Yaws Hospitals, and Bacteriologist. In 1915 he took a temporary commission as Lieutenant in the R.A.M.C., and served in Egypt under Colonel Leiper in the investigation of bilharziosis. After promotion to Captain, he was invalided, and then joined the staff of the London School of Tropical Medicine, as Assistant Helminthologist, and Assistant Medical Entomologist, under Lieutenant-Colonel Alcock, C.I.E., and also acted as Deputy Director of the school, and served on the staff of the Seamen's Hospital, Royal Albert Dock. He was a fellow of the Society of Tropical Medicine and Hygiene, and the author of several papers on tropical diseases.

Captain Owen Douglas Price, R.A.M.C. (S.R.), died in Edinburgh on 10th December, 1918, of pneumonia after influenza, aged 26. He was the son of the late Dr. Edmund Price, of Edinburgh, and was educated at the University in that city, where he graduated as M.B. and Ch.B. in 1915. He took a commission as Lieutenant in the special reserve of the R.A.M.C. on 7th October, 1915, and was promoted to Captain after six months' service.

Surgeon-Lieutenant Myrddin Emrys Jones, R.N., died in December, 1918, of pneumonia, aged 23. He was the second son of Alderman R. E. Jones, of Boderwydd, Llanberis, was educated at St. Thomas' Hospital, and took the M.R.C.S. and L.R.C.P. (Lond.) in January, 1918. After acting as House Surgeon at St. Thomas', he took a temporary commission in the Navy, and was serving on H. M. S. *Indomitable*.

Captain Lachman Das, I.M.S., died at Karachi on 27th October, 1918. He took a temporary commission as Lieutenant in the I.M.S., on 27th July, 1917, and was promoted to Captain after a year's service.

Captain Falkiner Malton Hewson, R.A.M.C., died of influenza at Mhow, Rajputana, on 22nd October, 1918, aged 35. He was educated in the medical school of the R.C.S.I., Dublin, took the L.R.C.P. and S.I. in 1907, and entered the R.A.M.C. as Lieutenant on 4th February, 1908, becoming Captain on 4th February, 1911.

Major Arthur Vernon Ford, R.A.M.C. (T.F.), died after a long illness, at Seaview, Isle of Wight, on 13th December, 1918. He was educated at St. Thomas' Hospital, and took the M.R.C.S. and the L.R.C.P.I., over forty years ago, in 1876. He was Consulting Surgeon to the Portsmouth Eye and Ear Infirmary, and held a commission as Major, R.A.M.C. (T.F.), dated 21st July, 1908, in the 5th Southern (Portsmouth) General Hospital.

Captain John Munro Gage, R.A.M.C., was reported as having died on service, in the casualty list published on 16th December, 1918. He was educated in Dublin, and took the L.R.C.P. and S.I. in 1910. After acting as House Surgeon at Mercer's Hospital, Dublin, and at Noble's Hospital, Douglas, he went in for lunacy, and was Senior Assistant Medical Officer at the Royal Earlswood Institution, Redhill

Surrey, when he took a temporary commission as Lieutenant in the R.A.M.C., on 1st January, 1916, and was promoted to Captain after a year's service.

Assistant Surgeon Henry Alexander Fox, Indian Medical Department, died of pneumonia at the Station Hospital, Firozpur, on 19th October, 1918, aged 34. He was born on 18th November, 1883, the son of Captain and Senior Assistant Surgeon G. F. Fox, I.M.D. (retired), and attained warrant rank on 25th February, 1904. He served in the Mohmand campaign on the North-West Frontier of India in 1908, receiving the medal with a clasp, and had gained the Distinguished Conduct Medal in the present war.

Major R. S. Armour, R.A.M.C., was reported as having died on service, in the casualty list published on 16th December, 1918. He took a temporary commission as Lieutenant in the R.A.M.C. on 4th June, 1915, was promoted to Captain after a year's service, and recently to Major.

During the fourteen days, 18th to 31st December, 1918, the number of casualties among officers reported was 169. Though over a month has elapsed since the signing of the armistice on 11th November, a few belated casualties are still being reported, cases of wounded not previously reported, of men formerly missing now returned as killed, etc. Men are still killed in aviation accidents, and deaths from disease, of course, still occur. The two last causes will continue to operate for a long time to come. But with the close of the year 1918, and with what at present appears to be the end of the war, these notes, continued for the past four and-a-half years, may well end.

These 169 casualties are tabulated as follows:—

Killed	...	...	...	36
Died	...	...	...	97
Wounded	...	...	...	35
Missing	...	...	...	1
Prisoners	...	...	...	...
TOTAL				169

The number of casualties among medical officers reported during these fourteen days has been ten. The names are given below. All, not specially otherwise noted, are temporary officers of the R. A. M. C.

Died.—Lieutenant-Colonel W. T. Freeman (T. F.); Major A. U. Parkhurst (South Africa); Major and Quartermaster H. J. Adair (Canadians); Captains J. V. Duffy, H. R. Lawrence, M.C. (South Africa), A. J. Milne (South Africa); Surgeon-Lieutenant-Commander M. H. Langford, D.S.O. (R. N.); Surgeon-Lieutenant M. Meehan (R. N.); Dr. J. M. Pickthall (S.S. *Britannia*); Sister D. A. FitzHenry (South Africa); Miss S. J. Armstrong (V. A. D.).

Wounded.—Captain R. H. Jones.

Captain Arthur John Milne, South African Medical Corps, was returned as having died on service, in the casualty list published on 30th December, 1918. He was educated at Aberdeen, where he graduated as M.B. and Ch.B. in 1901, also taking the D.P.H. in 1903, and subsequently the certificate of the London School of Tropical Medicine. He then took up the post of Medical Officer of Health in Mauritius, and was serving as Assistant Medical Officer of Health at Johannesburg, in the Transvaal, where he joined the South African Forces.

Surgeon-Lieutenant-Commander Martyn Henry Langford, D.S.O., R.N., died of influenza at Dar-es-Salam, East Africa, on 15th December, 1918, aged 34. He was the only son of Mr. H. J. Langford, of Trenant, Plymouth, and was educated at Middlesex Hospital, taking the M.R.C.S. and L.R.C.P. (Lond.) in 1909. He entered the Navy as Surgeon on 5th November, 1909, and was promoted to Staff Surgeon on 5th November, 1917. On 5th December, 1912, he was appointed to H.M.S. *Inflexible*, and was serving in her when she took part in the action in which Von Spee's Squadron was destroyed off the Falkland Islands in December, 1914, and when she was sunk by a mine in the Dardanelles on 18th March, 1915. For his services on that occasion he received the D.S.O. He afterwards served for two years in the Royal Naval Hospital, Chatham, and on December, 1917, was posted to H.M.S. *Challenger*.

Major Arthur Usk Parkhurst, South African Medical Corps, was reported as having died on service, in the casualty list published on 21st December, 1918. He was educated at St. Mary's Hospital, and took the L.S.A. in 1901. He served as a Civil Surgeon in the South African War in 1901-02, receiving the medal, and as Medical Officer of H.M.S. *Transport Aurantia* in 1902-03. He was in practice at Estcourt, Natal, before the war, till he joined the South African Forces, and went through the campaign in German South-West Africa before coming to Europe.

Surgeon-Lieutenant Michael Meehan, Royal Navy, died at the Italian Military Hospital at Venice, of pneumonia, on 13th December, 1918. He was the son of the late John Meehan, of Kildyeart, County Clare, and was educated in

the school of the Royal College of Surgeons, Dublin, taking the L.R.C.P. and S.I. in 1912. He entered the Navy as Surgeon on 11th April, 1913, and at the time of his fatal illness was serving on H.M.S. *Earl of Peterborough*.

Major and Quartermaster H. J. Adair, Canadian Army Medical Corps, was reported as having died on service, in the casualty list published on 27th December, 1918.

Captain Joseph Vincent Duffy, R.A.M.C., was reported as having died on service, in the casualty list published on 23rd December, 1918. He was educated at Glasgow, and took the Scottish Triple Qualification in 1914, after which he went into practice at Hebburn-on-Tyne; till he took a temporary commission in the R. A. M. C. as Lieutenant on 12th August, 1915, and was promoted to Captain after a year's service.

Captain Henry Ruthven Lawrence, M.C., South African Medical Corps, died in France of pneumonia on 14th December, 1918, aged 34. He was the only son of the late Dr. T. G. Lawrence, of George, South Africa, and was educated at Edinburgh, where he graduated as M.B. and Ch.B. in 1908, and as M.D. in 1910, also taking the F.R.C.S. (Edin.) in 1912 and studying at Dublin and Freiburg. He was in practice, at Newlands, Cape Town, and Surgeon to the Victoria Cottage Hospital at Wynburg, when the war began, and he joined the South African forces. He served in the campaign in German South-West Africa before coming to France.

Lieutenant-Colonel William Thomas Freeman, R.A.M.C. (T. F.) died suddenly at Reading on 24th December, 1918. He was educated at St. Bartholomew's Hospital, and took the M.R.C.S. and L.R.C.P. (Lond.) in 1879, and subsequently the F.R.C.S. in 1890, and the M.D. of Durham in 1899. After acting as House Surgeon of the Brighton and Hove Hospital, and Women's and Children's Lying-in Hospital, and then as Medical Officer of Bradfield College, Pangbourne, he went into practice at Reading about twenty years ago, where he was Medical Officer of H. M.'s prison, and successively Senior Assistant Physician and Physician for Diseases of the Skin, and then Full Physician to the Royal Berkshire Hospital. He held a commission as Lt.-Colonel, R. A. M. C. (T. F.), in the 3rd Southern General Hospital (Oxford), dated 3rd March, 1908, and served as such at Oxford at the beginning of the war. On the formation of Reading War Hospital, he returned to Reading and joined the staff there; being also in charge of Redlands War Hospital. He was President of the Reading Branch of the British Medical Association in 1898-99, and of the Oxford and Reading Branch in 1912-13.

Dr. John Maynard Pickthall, of Bridge House, Shillingford, Oxon, died in hospital at Cape Town, while serving as Surgeon to the Cables Ship *Britannia*, on 18th December, 1918. He was the third son of the late Revd. Wallis M. Pickthall, Rector of Cold Ash, Berkshire, and was educated at Aberdeen University and at Westminster Hospital, taking the Scottish Triple Qualification and also the L.S.A. in 1885. He had recently been serving on the Hospitalship *Oxfordshire*.

WITH reference to para. 9 of Army Instruction (India) No. 1343 of 1918, sanction is accorded to the following changes in the pay of sub-assistant surgeons of the Indian Medical Department, with effect from the 1st December, 1918:—

(a) Increases of pay as noted below:—

Grade of sub-assistant surgeons.	* Revised pay per mensem.
	Rs.
First class (having more than 15 years' service)	110
Senior second class	125
„ first „	140

The rates of pay for other classes will remain as at present.

(b) The abolition of the sub-medical and medical charge allowances at present admissible under Army Regulations, India, Volume I, paragraph 957 (1), (2) and (5), except those for the additional charge and sub-charge of cantonment hospitals and of daily labourers employed by the Military Works Services.

(c) Grant of a sub-charge allowance on the following scale for the sub-charge of Indian station hospitals:—

	Per mensem.
	Rs.
First-class hospital	40
Second „ „	30
Third „ „	20
Fourth „ „	15

* Inclusive of extra pay for qualification in English.

(d) Grant to sub-assistant surgeons holding temporarily sole charge of a fourth or higher class Indian station hospital, of a charge allowance at Rs. 25 per mensem in addition to the sub-charge allowance under clause (c) above.

(e) Grant of a charge allowance at Rs. 25 per mensem to sub-assistant surgeons holding charge of outpost hospitals† on the North-West Frontier.

2. The orders in para. 1 (a) and (b) will apply to military sub-assistant surgeons on field service as well as to the following:—

(i) Civil sub-assistant surgeons employed on military duty in India,

(ii) Civil sub-assistant surgeons whether on the active list or re-employed after resignation who have undertaken liability for general service.

3. Sub-assistant surgeons of the classes mentioned in para. 2 (i) and (ii) above are eligible for the allowances specified in para. 1 (c), (d) and (e).

As the prohibition against the retirement of Military Officers has been removed to the extent that I. M. S. Officers, "who have completed their tenure of administrative appointments or who have attained the age of 55 years and have also completed 30 years' service for pension," are now permitted to retire, a glance at the Army List will show that a considerable number come under this ruling.

Superannuation and retirement should carry with it some degree of *priority* in the allotment of passages Home.

It is understood that Colonel Garvie, I.M.S., will succeed Colonel H. E. Banatvala, C.S.I., I.M.S., on the latter's retirement as Inspector-General of Civil Hospitals and of Prisons in Assam.

THE following Army Instructions (India) have been published from Delhi during December, 1918.

Terms of service of temporary officers of the Indian Medical Service.

It has been decided that, in future, temporary officers of the Indian Medical Service who have undertaken liability for general service in India and abroad, and who, prior to proceeding overseas, wish to change their terms of engagement so as to be liable for service in India and Burma only, will be permitted to do so on the following conditions:—

(i) that the difference between the pay actually drawn since undertaking liability for general service overseas and that authorized for an officer engaged for local service only, will be refunded; and

(ii) that any amounts received as gratuity will be refunded, and all claim to further gratuity forfeited.

2. Officers who, after returning from service overseas, desire to change their conditions of service, will be permitted to do so on the condition that they will refund—

(i) the difference between the pay actually drawn since the date of their disembarkation in India on return from field service, and that admissible for the same period to an officer engaged for local service only;

(ii) all amounts received as gratuity in respect of any year of service which has been completed since their last return to India, and will forfeit all claim to further gratuity.

INCREASE of the rates of pay and uniform allowance admissible to members of the Queen Alexandra's Military Nursing Service for India.

It has been decided, as a temporary measure for the period of the war and six months thereafter, that the present rates of pay of members of the Queen Alexandra's Military Nursing Service for India shall, with effect from the 1st December, 1918, be revised as shown below:—

	Revised rates of pay per mensem.
	Rs.
Chief Lady Superintendent (pay Rs. 650 plus an allowance of Rs. 100)	750
Lady Superintendent	450
Lady Superintendent if not provided with free quarters, furniture, etc.	520
Senior Nursing Sister after 5 years' service in that grade	350
Senior Nursing Sister on promotion to that grade	325
Nursing Sister after 11 years in the service.	300
Nursing Sister after 5 years in the service	275
Nursing Sister on appointment	250

† Girni, Khirgi, Jatta, Pezu, Fort Lockhart (winter), Hangu (summer) and Fort Cavagnari.

2. Sanction is also accorded, for the period of the war and six months thereafter, to the increase from Rs. 60 to Rs. 120 of the annual uniform allowance admissible to the members of the above mentioned service.

GRANT of charge allowance, of Rs. 25 per mensem to military and civil sub-assistant surgeons placed in charge of the X-Ray apparatus, installed in military hospitals in India and Mesopotamia and on hospital ships, when a qualified commissioned medical officer is not available.

It has been decided that with effect from the 10th October, 1916, and for the period of the war, military and civil sub-assistant surgeons who are placed in charge of X-Ray apparatus installed in military hospitals in India and Mesopotamia and on hospital ships, in addition to the sub-charge of the apparatus, shall be granted a charge allowance of Rs. 25 per mensem, for the period during which a qualified commissioned medical officer is not available for the charge.

GRANT of sub-medical charge allowance to civil sub-assistant surgeons while holding sub-charge of Indian general hospitals, and sections of field ambulances, stationary and clearing hospitals.

It has been decided that the sub-medical charge allowance sanctioned in Army Instructions (India) Nos. 84 and 522 of 1918 for military sub-assistant surgeons shall also be admissible to civil sub-assistant surgeons when appointed to the sub-medical charge of an Indian general hospital or section of an Indian or combined field ambulance or clearing hospital, or stationary hospital of 25 beds, in which a separate dispensary is maintained, whether the section of the field ambulance or clearing hospital is detached or not.

THE pay of military sub-assistant surgeons has been fixed as follows (India Army Instruction No. 1436), with effect from 1st December, 1918:—

(a) Increases of pay as noted below:—

Grade of sub-assistant surgeon.	Revised pay per mensem.
First class (having more than 15 years' service) ...	Rs. 110
Senior second class ...	125
„ first „ ...	140

The rates of pay for other classes will remain as at present.

(b) The abolition of the sub-medical and medical charge allowances at present admissible under Army Regulations, India, Volume I, paragraph 957 (1), (2) and (5), except those for the additional charge and sub-charge of cantonment hospitals and of daily labourers employed by the Military Works Services.

(c) Grant of a sub-charge allowance on the following scale for the sub-charge of Indian station hospitals:—

	Per mensem.
	Rs.
First class hospital ...	40
Second „ „ ...	30
Third „ „ ...	20
Fourth „ „ ...	15

(d) Grant to sub-assistant surgeons holding temporarily sole charge of a fourth or higher class Indian station hospital, of a charge allowance at Rs. 25 per mensem in addition to the sub-charge allowance under clause (c) above.

(e) Grant of a charge allowance at Rs. 25 per mensem to sub-assistant surgeons holding charge of outpost hospitals* on the North-West Frontier.

2. The orders in paragraph 1 (a) and (b) will apply to military sub-assistant surgeons on field service as well as to the following:—

(i) Civil sub-assistant surgeons employed on military duty in India.

SUBJECT to His Majesty's approval, the following promotions are made, with effect from the dates specified:—

Lieutenant to be Captain, I. M. S.

William Miller Will, M.B., 29th January, 1918.

Temporary Lieutenants to be Temporary Captains, I. M. S.

Mohammad Salamat Ullah, M.B., 5th February, 1918; Sailendra Nath Chandra, M.B., 2nd June, 1918; Jitendra Nath Ray, 2nd August, 1918; Manindra Chandra Datta

* Girmi, Khirgi, Jata, Pezu, Fort Lockhart (winter), Hangu (summer) and Fort Cavagnari.

(since resigned), 24th August, 1918; Bharat Chandra Ghose, F.R.C.S.E., and Raja Singh, M.B., 6th October, 1918; Jiwan Mal Chopra, M.B., 19th October, 1918; Leonard John Pavillet Mordaunt, 20th October, 1918; Kelat Chandra Bhattacharya, M.B., 1st November, 1918; Sistla Lakshmipathi Somayaji and Bhola Nath, 6th November, 1918; Kandathil Mathulla Mathew, 8th November, 1918; Bantwal Rama Bhatji, 9th November, 1918; Chakkingal Krishna Menon, 13th November, 1918; Daivasi Kawayi Iyer Kanaka Sabhesan, 22nd November, 1918; Suresh Chandra Banerji, M.B., 23rd November, 1918; Subbaraya Kumaraswami Pillai, 25th November, 1918; and Bola Dayanand Rao, 26th November, 1918.

SUBJECT to His Majesty's approval, the under-mentioned to be temporary Lieutenants, with effect from the dates specified:—

Girija Sankar Chatarji, 23rd September, 1918; Sorab Dinshawji Anklesaria, 1st November, 1918; Hem Chandra Barua, 25th November, 1918; and Surendra Nath Chowdhury, 1st December, 1918.

SUBJECT to His Majesty's approval, the services of temporary Lieutenant Jnanendranath Chatterjee, Indian Medical Service, are dispensed with, on account of medical unfitness, with effect from the 13th December, 1918.

THE services of Lieutenant-Colonel J. L. Marjoribanks, M.D., I.M.S., are replaced at the disposal of the Government of Bombay, with effect from the date on which he assumed charge of his duties.

SUBJECT to His Majesty's approval, temporary Captain Vinayak Balvant Gokhale, Indian Medical Service, is permitted to resign his commission, with effect from the 3rd January, 1919.

THE following medical postings have been arranged on the turn of the officers from military duty:—

Major J. W. Watson, I.M.S., has been posted as Agency Surgeon, Eastern Rajputana States, relieving Major C. B. McConachey, I.M.S., who proceeds to Bhopal as Agency Surgeon.

Major J. R. J. Tyrrell, I.M.S., has been posted as Agency Surgeon, Bundelkhand, and Major G. D. Franklin, I.M.S., as Agency Surgeon, South States of Rajputana.

THE following notification by the Government of India, Home Department (Medical), is republished:—

No. 29-C., dated the 2nd January, 1919.

The services of Colonel W. E. Jennings, M.D., I.M.S., are replaced at the disposal of the Government of Bombay, with effect from the 11th January, 1919.

HIS EXCELLENCY THE GOVERNOR OF BOMBAY IN COUNCIL is pleased to appoint Colonel W. E. Jennings, M.D., C.M. (Edin.), D.P.H. (Ire.), I.M.S., to be Surgeon General with the Government of Bombay, *vice* Surgeon General R. W. S. Lyons, M.D., M.Ch. (Q. U. I.), M.A.O. (R. U. I.), I.M.S., retiring.

HIS EXCELLENCY THE GOVERNOR OF BOMBAY IN COUNCIL is pleased to appoint Major A. F. Hamilton, M.B., F.R.C.S., I.M.S., to be sub. *pro tem.* Civil Surgeon, 1st class, *vice* Lieutenant Colonel J. B. Smith, M.B., M.Ch. (R. U. I.), D.P.H. and D.T.M. & B. (Quartab.), C.B., I.M.S., reverted to military duty.

IN modification of so much of Government Notification No. 7526, dated the 29th October, 1918, as relates to the appointment of Lieutenant-Colonel S. H. Burnett, M.B., C.M., I.M.S., the Governor in Council is pleased to appoint him, on reversion to civil duty, sub. *pro tem.* Surgeon to the Gokuldas Tejpal Native General Hospital in addition to his own duties as Presidency Surgeon, First District, *vice* Lieutenant-Colonel A. Hooton, I.M.S., reverted to military duty.

IN modification of so much of Government Notification No. 7517, dated the 29th October, 1918, as relates to the appointment of Major A. F. Hamilton, I.M.S., it is hereby notified that he acted as Physician in charge Bai Motilal and Sir D. M. Petit Hospitals and Professor of Midwifery, Grant Medical College, from the 1st to the 6th October, 1918, both days inclusive, in addition to his military duties, during the absence on leave of Lieutenant-Colonel S. C. Evans, M.B., C.M. (Edin.), I.M.S.

IN modification of so much of Government Notification No. 188, dated the 8th January, 1919, as relates to Lieutenant-Colonel J. L. Marjoribanks, M.D., D.P.H. (Edin.), I.M.S., His Excellency the Governor of Bombay in Council is pleased to appoint him, on reversion from military duty, to be Health Officer of the Port of Aden and Medical Officer, European General Hospital, Aden, *vice* the Reverend J. C. Young, M.B., C.M.

HIS EXCELLENCY THE GOVERNOR OF BOMBAY IN COUNCIL is pleased to appoint Assistant Surgeon P. P. Fernandez, L.M. & S., to act as Deputy Sanitary Commissioner, Western Registration District, in addition to his own duties, *vice* Lieutenant-Colonel A. V. Anderson, M.B., D.P.H., I.M.S. (retired), proceeded on leave, pending further orders.

MAJOR CHARLES THOMSON, M.B. (retired), whose re-employment was notified in Army Department Notification No. 559, dated the 11th June, 1915, has been permitted to resign, with effect from the 5th December, 1918.

LIEUTENANT-COLONEL C. H. BENSLEY, M.R.C.S., L.R.C.P., I.M.S., Inspector-General of Prisons, sub. *pro tem.*, is confirmed in that appointment, with effect from the 26th November, 1918.

No. 838 First Class Sub-Assistant Surgeon Gokalchand, *vice* No. 725 First Class Sub-Assistant Surgeon Waliullah, promoted, with effect from the 1st June, 1917.

No. 840 1st Class Sub-Assistant Surgeon Narain Das, *vice* No. 775 1st Class Sub-Assistant Surgeon Ghulam Dastgir Khan, promoted, with effect from the 1st July, 1917.

No. 842 1st Class Sub-Assistant Surgeon Lachhman Singh, *vice* No. 777 1st Class Sub-Assistant Surgeon Hira Lal, promoted, with effect from the 1st July, 1917.

No. 852 1st Class Sub-Assistant Surgeon Wahidyar Khan, *vice* No. 797 1st Class Sub-Assistant Surgeon Brindaban, promoted, with effect from the 1st February, 1918.

No. 867 1st Class Sub-Assistant Surgeon Jiwan Mal, *vice* No. 770 1st Class Sub-Assistant Surgeon Buta Singh, invalided, with effect from the 12th July, 1918.

Madras Establishment.

No. 1257 1st Class Sub-Assistant Surgeon M. Kalu, *vice* No. 1245 1st Class Sub-Assistant Surgeon N. Vijayaraghava Mudali, promoted, with effect from the 1st March, 1918.

Bombay Establishment.

No. 217 1st Class Sub-Assistant Surgeon Benjamin Reuben, *vice* No. 818 1st Class Sub-Assistant Surgeon Karam Husain, Bengal Establishment, promoted, with effect from the 1st November, 1918.

THE services of Major A. C. Ingram, M.D., I.M.S., are placed at the disposal of the Government of Madras, with effect from the date on which he is relieved of his present duties.

O. B. E.

(London Gazette, 15th November, 1918; Gazette of India, 1st February, 1919.)

O. B. E. for Mesopotamia.

Major S. K. Christophers, C.I.E., I.M.S.; Major F. P. Mackie, M.D., F.R.C.S., I.M.S.

O. B. E. for East Africa.

Lieutenant-Colonel S. R. Rost, I.M.S.; Major E. L. Scott, I.M.S.; and Major C. E. Southon, I.M.S.

SUB-ASSISTANT SURGEON BRANCH.

Madras Establishment.

2nd class Senior Sub-Assistant Surgeon Rai Sahib N. Sadasiva Pillai (supernumerary) to be 1st class Senior Sub-Assistant Surgeon, ranking as Subadar (supernumerary);

2nd class Senior Sub-Assistant Surgeon P. Ratnam Pillai to be 1st class Senior Sub-Assistant Surgeon, ranking as Subadar; and

No. 1249, 1st class Sub-Assistant Surgeon Robert Sahu (Supernumerary), 2nd class Senior Sub-Assistant Surgeon is absorbed in the grade of 2nd class Senior Sub-Assistant Surgeon, ranking as Jamadar;

vice 1st class Senior Sub-Assistant Surgeon Saiyid Sulaiman, deceased; with effect from the 25th October, 1918.

(Army Department Notification No. 2926, dated the 13th December, 1918, is hereby cancelled.)

2nd class Sub-Assistant Surgeon (supernumerary 1st class Senior Sub-Assistant Surgeon, ranking as Subadar) Rai Sahib

N. Sadasiva Pillai is absorbed in the grade of 1st class Senior Sub-Assistant Surgeon, ranking as Subadar;
vice 1st class Senior Sub-Assistant Surgeon T. P. Soma-sundaram Pillai, invalided with effect from the 1st November, 1918.

No. 1252, 1st class Sub-Assistant Surgeon (supernumerary 2nd class Senior Sub-Assistant Surgeon) M. Kadir Sharif is absorbed in the grade of 2nd class Senior Sub-Assistant Surgeon, ranking as Jamadar; to complete establishment.

IN exercise of the power conferred by Section 6, subsection 3, of the Indian Universities Act, 1904 (VIII of 1904), His Excellency the Chancellor of the Calcutta University is pleased to approve of the following elections of Ordinary Fellows by the Faculties of Arts and Medicine, with effect from the dates mentioned against their names.

Elected by the Faculty of Arts.

(1) Principal Herambachandra Maitra, M.A. (with effect from 18th March, 1919).

(2) Dr. Harendracoomar Mookerjee, M.A., Ph.D. (with effect from 30th January, 1919).

Elected by the Faculty of Medicine.

Lieutenant-Colonel A. Laventon, I.M.S., F.R.C.S.I. (with effect from 4th January, 1919).

ASSISTANT SURGEON BRANCH.

Bombay Establishment.

THE undermentioned 3rd class Assistant Surgeons having completed five years' service in that class, to be 2nd class Assistant Surgeons, with effect from the dates noted against their names:—

Abel Martin, Claude Willoughby Wale, Edward D'Silva, Ernest Ralph Grant and Cecil Allan Ashley Emile, dated 29th December, 1918; Dominic Vincent Gomes and Kenneth William Everard White, dated 31st December, 1918.

4th class Assistant Surgeon Francis Gilbert Frederick Deatker having completed seven years' service in that class, to be 3rd class Assistant Surgeon, with effect from the 15th December, 1918.

SUB-ASSISTANT SURGEON BRANCH.

Bombay Establishment.

No. 354, 2nd class Sub-Assistant Surgeon John Peter Andrews having completed five years' service in that class, to be 1st class Sub-Assistant Surgeon, with effect from the 7th January, 1919.

WAR OFFICE, 16th November, 1918.

HIS MAJESTY THE KING has been graciously pleased to award the Royal Red Cross to the undermentioned Ladies of the Nursing Services in recognition of their valuable services in connection with the war. Dated 3rd June, 1918:—

Awarded the Royal Red Cross.

1st Class.

Miss Lallah Bessie Dunwoodie, Lady Superintendent, Q.A.M.N.S.I.

Miss Irene Annie McNally, Senior Nursing Sister, Q.A.M.N.S.I.

Awarded the Royal Red Cross.

2nd Class.

Miss Winifred Mary Aldridge, Acting Senior Nursing Sister, Q.A.M.N.S.I.

Miss Violet Isabel Lamb, Senior Nursing Sister, Q.A.M.N.S.I.

IN accordance with Rules 18 and 26 of the Regulations of the Central Provinces Medical Examination Board, the following officers are appointed Examiners in the subject or subjects specified against their names at the Primary, Intermediate and Final Examinations of the students of the Robertson Medical School, Nagpur, and the Professional Examination of Sub-Assistant Surgeons in these Provinces for the year 1919:—

Name.	Examination.	Subject.
Mr. R. H. Beckett, B.Sc., I.E.S., Principal, Victoria College of Science, Nagpur.	Primary Examination.	Chemistry and Physics (Written and Practical).
Rai Sahib B. B. Gupta, L.M.&S., Civil Surgeon, Raipur.	Intermediate Examination.	Anatomy (Written and Practical).

Name.	Examination.	Subject.
Mr. M. R. Cholkar, L.M. & S., Private Medical Practitioner, Nagpur.	Do. ...	Physiology (Written and Practical).
Lieut.-Colonel C. H. Bensley, M.R.C.S., L.R.C.P., I.M.S., Inspector-General of Prisons, Central Provinces.	Do. ...	Materia Medica and Pharmacy (Written and Practical).
	Professional Examination of Sub-Assistant Surgeons.	Materia Medica and Pharmacy (Practical).
	Final Examination.	Medicine, including Medical Pathology and Therapeutics (Written and Practical).
Rai Bahadur S. N. Barat, M.B., Civil Surgeon, Wardha.	Professional Examination of Sub Assistant Surgeons.	Medicine and allied subjects (Written and Practical).
	Final Examination.	Surgery, including Surgical Pathology and Operative Surgery (Written and Practical).
Major W. Tarr, M.D., F.R.C.S., I.M.S., Civil Surgeon, Jubbulpore	Professional Examination.	Surgery and allied subjects (Written and Practical).
	Final Examination.	Midwifery and Gynaecology (Written and Practical).
Lieut.-Colonel A. Buchanan, M.A., M.D., M.Ch., M.A.O., I.M.S., Civil Surgeon and Superintendent, Robertson Medical School and Lunatic Asylum, Nagpur.	Professional Examination of Sub-Assistant Surgeons.	Midwifery (Practical).
	Final Examination.	Medical Jurisprudence and Hygiene, including Vaccination (Written and Practical).
Major T. G. N. Stokes, B.A., M.B., B.Ch., B.A.O., L.M., D.T.M. & H., I.M.S., Sanitary Commissioner, Central Provinces.	Professional Examination.	Medical Jurisprudence and allied subjects (Written and Practical).
	Do. ...	Hygiene and Vaccination (Practical).

FOR the purposes of Section 73 of the Government of India Act, 1918 (5 and 6 Geo. 5, ch. 61), and in pursuance of the provisions of Regulation XI (a) of the Regulations for the nomination and election of Additional Members of the Legislative Council of the Governor of Bombay, published in the Notification of the Government of India in the Legislative Department No. 16, dated the 15th November, 1909, His Excellency the Governor has been pleased to nominate Colonel William Earnest Jennings, M.D., C.M. (Edin.), D.P.H. (Ire.), F.C.P.S. (Bom.), I.M.S., being an official, to be an Additional Member of the said Council, in place of Major-General R. W. S. Lyons, M.D., I.M.S., resigned.

INDIAN MEDICAL SERVICE.

To be acting Lt.-Cols. while Comdg. Indian Cavy. Field Ambs. :-

16th December, 1917.

Major W. H. Cazaly, Major J. J. Urwin, Major E. C. Hodgson, D.S.O.

LIEUTENANT-COLONEL SIR JAMES ROBERTS, C.I.E., M.B., F.R.C.S., I.M.S., Civil Surgeon, Simla (West), was granted privilege leave for six weeks with effect from the 15th December, 1918.

Lieutenant-Colonel G. Tate, M.B., I.M.S., Civil Surgeon, Simla (East), is appointed to officiate as Civil Surgeon, Simla (West), in addition to his own duties, during the absence on leave of Lieutenant-Colonel Sir James Roberts, C.I.E., M.B., F.R.C.S., I.M.S.

His Excellency the Governor of Bombay in Council has been pleased to make the following appointments during the absence of Reverend Dr. MacRae :-

Major M. S. Irani, I.M.S., to act as Civil Surgeon, Aden, in addition to his military duties, with effect from the 6th December, 1918.

Captain J. W. Barnett, I.M.S., to act as Superintendent, Special Prison Crater, Aden, in addition to his military duties, with effect from the 6th November, 1918.

THE following Notification by the Government of India, Home Department (Medical) is republished :-

"No. 438-C, dated the 17th January, 1919.

The services of Lieutenant-Colonel J. L. Marjoribankt, M.D., I.M.S., are replaced at the disposal of the Governments of Bombay with effect from the date on which he assumed charge of his duties.

MAJOR F. NORMAN WHITE, I.M.S., and Major E. D. W. Greig, I.M.S., are proceeding at once to Europe to take part in the Inter-Allied Sanitary Conference at Paris, which commences on March 20. It is expected that the recent influenza epidemic will form an important subject at the deliberations of the conference. Major White will be succeeded as Sanitary Commissioner with the Government of India by Lieutenant-Colonel F. H. G. Hutchinson, I.M.S.

THE undermentioned passed students of the Medical College, Calcutta, are admitted into the service of Government as temporary Assistant Surgeons :- Babu Praphulla Ranjan Das Gupta, M.B., Babu Sita Nath Ghosh, M.B., Babu Manmatha Nath Chatterji, M.B.

LIEUTENANT-COLONEL E. A. R. NEWMAN, C.I.E., I.M.S., Civil Surgeon, Dacca, is allowed combined leave for seven months on medical certificate.

Lieutenant-Colonel C. A. Lane, I.M.S., Civil Surgeon, Hooghly, is allowed combined leave for eight months on medical certificate.

Major R. E. Lloyd, I.M.S., Officiating Civil Surgeon, Serampore, is appointed temporarily to act as Civil Surgeon, Hooghly, in addition to his own duties, during the absence on leave of Lieutenant-Colonel C. A. Lane, I.M.S.

Notice.

SCIENTIFIC Articles and Notes of interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements, and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscription to "*The Indian Medical Gazette*," Rs. 14, including postage, in India. Rs. 16, including postage, abroad.

BOOKS, REPORTS, &c., RECEIVED :-

Lt.-Col. C. C. Barry, Gynaecological Cases. Rangoon, Government Press.

Lt.-Col. C. C. Barry. When and How to Perform Minor Gynaecological Operations. Rangoon, Government Press.

Proceedings of the Canal Zone Medical Association, Vol. X, pt. 1 (1918).

Dr. Chas. H. Duncan's Autotherapy (2612 Broadway, New York City).

Sir J. Barrett and Deane's Australian Army Medical Corps. H. K. Lewis, London. Demy 8vo. Price 12s. 6d. net.

Bengal Annual Medical List, 1919.

Dr. I. G. Cobb's Internal Secretion, Second Edition, Baillière, Tindall, and Cox, 1918. Price 7s. 6d. net.

Hyderabad Plague Report, 1916-17.

LETTERS, COMMUNICATIONS, &c., RECEIVED FROM :-

Major-General W. E. Jennings, I.M.S., Bombay; Lt.-Col. C. C. Barry, C.I.E., I.M.S., Rangoon; Capt. J. F. James, I.M.S., Karachi; Dr. Bramachari, Calcutta; Dr. E. Muir, Kalna; Lt.-Col. F. P. Connor, F.R.C.S., I.M.S., Basra; Dr. Korhouna, Karachi; Lt.-Col. Sutherland, I.M.S., Calcutta; Dr. Anklesaria, Karachi; Major-General P. Behar, Rawalpindi; Colonel G. W. P. Denny, C.I.E., Shillong; Major Sandes, Calcutta; Lt.-Col. R. Bryson, I.M.S., Madras.

Original Articles.

SAND-FLY FEVER AND ITS RELATIONSHIP TO DENGUE.

By J. W. D. MEGAW, B.A., M.B.,

MAJOR, I.M.S.,

Principal and Professor of Pathology, King George's Medical College, Lucknow.

SAND-FLY FEVER is generally regarded as being distinct from dengue.

Are there sufficient grounds for this view?

To show that this question is not merely one of academic interest it is only necessary to refer to Manson's "Tropical Diseases," in which the following diseases are described:—

I. "Dengue."

II. "Phlebotomus Fever" (otherwise known as "Sand-Fly Fever," "Pappataci Fever," and "Three-Day Fever").

III. "Seven-Day Fever of Indian Ports."

In the previous edition there was also described as a separate entity the "Three-Day Fever of Chitral," this is now included in the description of phlebotomus fever.

The above three fevers are not even grouped together, and the numerous students who obtain their knowledge of tropical diseases from Manson's excellent book are compelled to make themselves familiar with the accounts of all the three fevers. If, as there is good reason to believe, these three fevers are clinically indistinguishable from each other, much confusion would be avoided by grouping them together. If, on the other hand, the diseases are really different from each other, it is important that the points of distinction should be stated in a clear and definite manner.

Between the years 1906 and 1909, in Calcutta, I took part in a discussion as to the nature of the seven-day fever and incidentally of the three-day fever of Chitral, and at the time I produced evidence which satisfied myself, if not other people, that there were no sufficient grounds for separating these fevers from the old established clinical entity "Dengue."

During the ten years that have elapsed the seven-day fever has come to be generally regarded as dengue, but the three-day fever under a new name has established itself in the medical world as an independent disease.

Its right to this position of independence has been challenged several times, and even now the French physicians usually refer to it as "Mediterranean Dengue," but most English doctors accept it without question as a distinct disease.

A silence of more than ten years is my chief justification for returning to the discussion

There is a tendency among medical investigators as well as among biologists to ask for the acceptance of new names which they desire to apply to types differing very slightly from the existing recognized types.

This makes for complexity if not for confusion, and so it is necessary that every new term that is suggested should be submitted to a strict scrutiny before being accepted.

Even if an old familiar name is indefinite and unscientific, it has a great advantage over a new name that is equally indefinite and unscientific.

It seems reasonable to demand that no disease should be accepted as a new and distinct entity until it has been shown to be specifically different from each of the generally recognized diseases.

A very good example of the confusion and complication that arise from the ready acceptance of new names is seen in the following recent additions to the list of diseases:—

"Three-Day Fever," "Sand-Fly Fever," "Phlebotomus Fever," "Pappataci Fever," "Seven-Day Fever," and "Six-Day Fever," etc.

There would appear to be a case for the appointment of a standing committee for the examination of the claims of all who aspire to the placing of a new name in the catalogue of diseases.

A BRIEF HISTORY OF THE DENGUE GROUP OF FEVERS UP TILL 1902.

Fifteen years ago the only name that was generally recognized as applying to the fevers already referred to was dengue, but a glance at Mense's *Hand-book of Tropical Diseases* will show that even then dengue possessed a formidable list of "aliases." There were about a hundred of these, of which about fifty were in English. It is clear that either "dengue" was a name applied to a number of distinct clinical entities or that the inventors of new names for old diseases were already at work.

Dengue has been clearly recognized for about 140 years, but the first clear account of its existence in India was in 1824, when it appeared in Calcutta and spread rapidly over the greater part of India. Scarcely any one in Calcutta escaped, so it is evident that the population was very susceptible to the disease. This may have been because it had been absent for a considerable time or because it was new to India and had been enabled to reach the country by the increased speed of overseas communication with other countries of the east.

Again in 1871-73 dengue appeared in epidemic form in Calcutta and spread rapidly over the greater part of India. Between these two epidemics there were several milder epidemics, in some of which severe pains are stated to have been absent.

In 1897 Bassett Smith described dengue in Bombay, and in 1902 a severe outbreak reached Madras and Burma from Hong Kong, but there is no evidence of the disease having spread to the other parts of India.

For this very brief summary, I am indebted to the account given in Sir Leonard Rogers' epoch-making book on fevers in the tropics.

The original accounts of dengue show many differences between themselves and it is clear that the diseases either assumed a variety of forms, or, as Rogers thinks, that two diseases were described, one of which was dengue and the other seven-day fever.

HISTORY OF DENGUE AND THE ALLIED FEVERS FROM 1902 ONWARDS.

In 1902, James in his enquiries into malaria in Mian Mir noted the existence of a large number of short non-malarial fevers whose charts he published without notes.

In 1905, Sir Leonard Rogers definitely recognized the existence of a specific short non-malarial fever in Calcutta which he first described as an "Influenza-like Fever" and later as the "Seven-Day Fever of Calcutta."

In the *Indian Medical Gazette* of January 1906, McCarrison gave a clear and definite account of the "Three-Day Fever of Chitral." He found many points of similarity with dengue but concluded that "the absence of a rash and of terminal fever made it impossible to consider the disease dengue."

In the *Indian Medical Gazette* of November 1906, I described two attacks of fever of the seven-day type, from which I had suffered, and gave my reasons for thinking these to be dengue. In that paper the following classification of dengue as seen by me in Calcutta was given:—

I. The continued type of 6 or 7 days' duration, showing a terminal rise.

II. The interrupted type, showing a fever-free interval.

III. The short fever type, lasting less than four days and showing no marked terminal rise.

IV. The atebriale type, occurring in persons who are nearly immune. By attacks of this type of the disease it was thought that immunity was maintained among persons who live in endemic areas.

In this paper it was stated that "there is reason to suspect that dengue in some of its forms is not uncommon in some of the inland stations of India."

In the *Indian Medical Gazette* of February 1908, Lieutenant-Colonel Fooks, I.M.S., described an epidemic of dengue at Sialkot in which the seven-day and three-day types of fever occurred in approximately equal numbers. This was most important confirmatory evidence of

my views as to the existence of the long and short types of dengue, especially as the author did not appear to have read my paper.

In 1907, Ashburn and Craig, in the *Philippine Journal of Science*, described an outbreak of dengue which they believed to be conveyed by the *Culex fatigans* (the evidence is not convincing). They showed that dengue is due to an invisible virus and their account left little room for doubt that they were describing the same disease as was known as the "Seven-Day Fever of Calcutta": the charts in themselves being almost conclusive on this point.

In 1908 and 1909, Doerr described a fever in Southern Austria which obviously resembled the "Three-Day Fever"; he found that it was due to a filtrable virus and that it could be conveyed by the *Phlebotomus papatassi*.

In January 1909, in the *Indian Medical Gazette*, I summarized the available evidence and came to the following conclusions:—

"I. That the term dengue can properly be applied to the Seven-Day and the Three-Day Fever.

II. That dengue exists in most parts of India and perhaps in many parts of the tropics as an endemic fever, assuming a great variety of forms."

In this paper was given a new description of dengue, which embodied the conclusions arrived at by a study of the literature and of the outbreaks which had been described by others or seen by myself.

This description does not seem to require revision in any important respect except that the part played by the *Phlebotomus* and by the *Stegomyia* was not known to me at the time. (The paper was written before the account of Doerr's work had reached India.)

In 1910, Birt gave a clear account of "Phlebotomus Fever" in Malta and Crete; in this outbreak the three-day type appears to have preponderated.

In September 1911, Captain Munro, I.M.S., described in the *Indian Medical Gazette* an outbreak of dengue among fever the Indian troops in Alipore, Calcutta. In this about half the cases were of the seven-day type and half of the three-day type.

He also described an outbreak among British troops in Calcutta, which occurred at the same time; in this out of 55 cases 40 were of the seven-day type and 15 of the three-day type. He concluded that there was *prima facie* evidence that these pyrexias were a single disease, viz., dengue.

In a thesis written at the same time he went into the question in great detail and produced a great mass of evidence which had carried him to the same conclusion as had been reached by me some years previously.

Castellani, in his well-known text-book (1913), states that "Pappataci Fever" can only be distinguished from dengue by ending on the third day.

He also says "in our opinion the Seven-day fever is Dengue or a variety of it. Having had the opportunity of seeing Dengue in the Phillipine Islands and other countries where the disease is common, we find that the condition called Seven-day fever in India and Ceylon is clinically identical with it."

In the *British Medical Journal* in 1915, Col. Birt again writes on sand-fly fever or phlebotomus fever and quotes an interesting group of figures relating to his own cases in Malta and to Wimberley's cases:—

Duration in days	2	3	4	5	6	7 or 8
	%	%	%	%	%	%
Malta ...	20	30	23	12	9	5
Wimberley's ...	...	22	27	24	20	6

In his paper Birt lays special stress on the rash as the point by which dengue can be distinguished from phlebotomus fever.

Capt. Houston, R.A.M.C., in the same number of the *British Medical Journal*, after describing an outbreak of three-day fever in Peshawar mentions a seven-day fever as occurring sporadically during the summer months in Peshawar; in this fever a rash is sometimes seen. He distinguishes these cases from sand-fly fever as being more sporadic and as being of more than three days' duration.

In the *Indian Medical Gazette* of December 1916, Capt. Harnett, I.M.S., makes a critical analysis of the subject and gives numerous blood counts. The cases seen by him showed the following distribution as regards duration of the attack:—

Number of days ...	2	3	4	5	6	7
Per cent. ...	48.8	33.6	7.2	4.6	3.8	2

His conclusions closely agree with mine as will be seen from the following parallel columns:

Megaw, <i>Indian Medical Gazette</i> , January, 1909.	Harnett, <i>Indian Medical Gazette</i> , December, 1916.
The chief aim of the foregoing paper is to show that the term dengue can properly be applied to the fevers in India known as seven-day fever and three-day fever.	I am unable to fix any point by which the two (dengue and sand-fly fever) may be distinguished. Much of the available evidence seems to point to the conclusion that we are dealing not with two closely related fevers but with one and the same fever modified by circumstances as yet unknown

It is of course assumed in the above comparison that three-day fever and sand-fly fever are the same.

In December 1916, in the *Bull. Soc. Path. Exot.*, Sarrhailhe writes on "Dengue et Fievre de Trois Jours," he points out that in many

outbreaks of dengue, eruption and secondary fever are absent, while sometimes the eruption is present without the secondary fever and *vice versa*. The disease referred to was observed in Macedonia. He noticed in Salonika a short fever with an eruption like dengue, coinciding with the appearance of sand-flies, the duration was usually three days, rarely five; there were occasional relapses on the 4th or 5th day.

At about the same time another French authority, Arman Delille, describes the three-day fever in Salonika; he says that the eruption was common, while in the cases seen in the Dardenelles the eruption was rare.

In the *New Orleans Medical and Surgical Journal* of February 1917, King describes the types of dengue seen in Porto Rico. Again it is interesting to notice the close correspondence between his types and those described by me eight years previously:—

King—Porto Rico, 1917.	Megaw—Calcutta, 1909.
I. "Evanescent."	"Evanescent."
	"Short fever type."
II. "Interrupted fever" type.	"Interrupted fever" type.
III. "Saddle Back type" (Rogers).	"Saddle Back type" (Rogers).
IV. "Fever without remission."	"Continued fever type."

I have not seen King's original article. My information is taken from an extract in the *Indian Medical Gazette* of June 1917.

In the *Journal of Tropical Medicine and Hygiene* for August 1917, Castellani says "Dengue cannot be distinguished from Pappataci fever during the first two days, as the symptoms of the two diseases are identical, including the leucopenia. On the third day the fever generally drops in both maladies, but whereas in Pappataci fever the temperature often remains normal,—though there are many exceptions—in Dengue very often there is again slight fever. Moreover, in Dengue, when the temperature falls on the third day, the typical rash of Dengue appears during the crisis or soon after."

Archibald, in the *Journal of Tropical Medicine and Hygiene* of June 1917, describes an outbreak of seven-day fever in the Soudan. He divides the cases into two types, one clinically resembling dengue and the other a short abortive form very like the three-day fever of Chitral. He believes *Stegomyia* to be the transmitting agency.

In the *Journal of Hygiene* for January 1918, Cleland and Bradley have a very important article on the subject of dengue in Australia.

They have proved that the *Stegomyia fasciata* is capable of carrying the disease, and they criticise the evidence on which rests the view that *Culex fatigans* is the insect responsible.

The paper should be read in the original form by all who are interested in dengue.

Bonne, in the September 1918 number of the *Journal of Tropical Medicine and Hygiene*, describes what he calls a dengue-like fever in Dutch Guiana, most of the cases of which were of six or seven days' duration, but there were also cases of three days' duration, and also cases of ten to fourteen days, ending by lysis. He says that the rapid recovery and the mildness of the pains were unlike true dengue, and in many ways the disease more nearly agreed with the six-day fever of Panama and the seven-day fever of India.

He also "*considers it advisable to separate these dengue-like fevers from true dengue until the causative organism is found and differentiation made more easy.*"

This contention shows that the heresy still lives of regarding varying types as being distinct entities until they have been proved to be the same.

Buckeridge, in the *Journal of the Royal Navy Medical Service* for July 1918, describes an epidemic of sand-fly fever in a ship on the East Indian Station. The duration of the fever was six or seven days and a terminal rise of fever was noticed, but he considers that the absence of rash and slowness of the pulse distinguishes the fever from dengue.

There have been several other accounts of phlebotomus fever from the Mediterranean zone; most of these consist of clinical accounts of the disease with little that is new, but show how variable are the symptoms of the disease.

Adrien describes the disease in Syria as "Dengue Mediterranee," and Lambert describes a very similar disease as "Phlebotomus Fever" in Lemnos.

Lambert describes the duration of the fever as being—

3 days	4 days	5 days.
14%	31%	29%

The Differentiation of the Short Fevers of the Dengue Group.

Ten years ago the interest in this subject centered chiefly in the seven-day fever of Calcutta, and thanks to the powerful advocacy of my friend Sir Leonard Rogers, the medical profession of Calcutta was convinced that this fever was a separate entity; in fact my confrères became almost impatient with me for persisting in the belief that it was a form of dengue.

A few years later, owing to the arrival of an epidemic of the disease in which the break-bone pains and the rash were often pronounced, there was an entire reversal of opinion, and now few continue to regard the seven-day fever as distinct from dengue, though the articles by Bonne and Buckeridge indicate a definite tendency to revive Rogers' views. Those who are interested in the subject will find one side of the case stated in Rogers' work on fevers, while

the other side is stated in the papers by Munro and myself.

At the present time a more important practical question is the nature of phlebotomus fever otherwise known as sand-fly fever.

At first sight most people consider it to be so different from dengue that they cannot imagine the existence of any doubt on the subject. But when we look into the matter more closely, we find, as did McCarrison, that the differences dwindle down in a surprising manner. In fact, if one starts with the preconceived idea that the two diseases are different, and if he then proceeds to search for points on which to base a differential diagnosis, he is likely to find himself left at last with one or two points to which he is probably tempted to cling desperately lest he should have to give up his cherished opinion.

In any enquiry into sand-fly fever the first authority who should be consulted is McCarrison, who gave the first clear account of the fever under the name of the "Three-Day Fever of Chitral." If the disease should turn out to be a separate, one it seems to me that the name of McCarrison should be associated with it.

During the early discussion McCarrison rebuked me for assuming too lightly that the disease was the same as dengue, my view being that it is much safer to class a disease provisionally in a recognised group than to launch a new disease on the world. The onus of proof should lie entirely on the person who suggests the introduction of a new name.

But if the name suggested by McCarrison had to be dropped because the fever was by no means universally of three days' duration and was by no means confined to Chitral, it is not at all certain that the new name "Phlebotomus Fever" will stand the test of time. For there are several people who suggest that the fever is sometimes carried by other insects than the Phlebotomus.

The authorities who consider sand-fly fever to be distinct from dengue rely for the most part on the duration of the fever and on the rash for the differential diagnosis between the two conditions. Birt does not attach importance to the duration of the fever but lays special stress on the rash.

DURATION OF THE FEVER.

The following are some of the references to this point:—

Dengue.

Author.	Locality.	Statement as to duration.
Kennedy	India	"The third day critical."
Cavell	Do.	"36 hours."
Twining	Do.	"Falls after the third day."

Dengue—(contd.)

Author.	Locality.	Statement as to duration.
Raye ...	India ...	"Falls on the third day."
Charles ...	Do. ...	"Two days, occasional slight rise on the 4th-6th day."
Leichtenstern ..	General ...	"Three days" (no reference to secondary fever).
Manson ...	Do. ...	"One to four days with terminal rise on the 4th-7th day for a few hours after an interval free from fever."
Scheube ..	Do. ...	"Sometimes a renewed rise for a few hours from the 3rd-5th day."
Ashburn and Craig	Philippines	Most cases are of the long seven-day type.
Dengue Committee	Brisbane ...	"Four to six days, seldom longer."
Cleland and Bradley.	Australia ...	"Three to seven days."

Compare with this,—

"Sand-fly Fever."

Authority.	Locality.	Described duration.
Doerr ...	S. Austria ...	"2-3 days with secondary fever sometimes about 24 hours after the end of the first rise."
Birt ..	Malta; Crete	"27 per cent. were of more than three days' duration."
Gerrard ..	Malta ..	"42 cases showed the saddle-back type."
McCarrison ...	Chitral ...	"Of 78 cases only 9 showed a return of persistence of the fever after 3rd day."
Lambert ..	Lemnos ...	"4 days in 29 per cent., 5 days in 31 per cent. (In only 14 per cent. 3 days.)"
Wall ..	Chitral ...	"Some cases showed a relapse on the 6th or 7th day."
Buckeridge ...	East Indies	"Six or seven days."

Then take some of the outbreaks, the nature of which is in dispute,—

? "Seven-Day Fever" : ? "Dengue."

Authority.	Locality.	Duration.
Rogers ...	Calcutta ...	About seven days.
Megaw ...	Ditto ...	1 to 7 days.
Fooks ...	Sialkot ...	65 cases, "3 days"; 75 cases, "7 days"
Munro ...	Calcutta ...	About equal numbers in the three-day and seven-day groups.
Bonne ...	Dutch Guiana.	Mostly 6 or 7 days. Some 3 days. Some 10-14 days.

A glance at the above tables will show that the duration of the disease will not serve as a means of diagnosis between sand-fly fever and dengue.

It is a curious fact that in the original discussion with Sir Leonard Rogers he insisted

that the seven-day fever could not be dengue as dengue was always described as a fever of three or four days' duration. Now I have to face the argument that sand-fly fever cannot be dengue, because the latter is a fever of longer duration.

It is quite clear that dengue may be a fever of less than three days' duration or a fever of three to seven days, and also that sand-fly fever may be a fever of four to seven days' duration as well as of three days or less.

In certain epidemics the short or the long type of fever predominates, but in many epidemics they occur in about equal numbers.

It might be argued that when numbers of cases of the two types occur at the same time we are really dealing with two distinct diseases occurring simultaneously, but if this were so, some of the writers would be sure to mention the occurrence of both types of fever in the same person at short intervals.

The absence of any reference to such occurrences strongly suggests that an attack of the short fever protects against an attack of the longer fever and *vice versa*.

This constitutes very strong evidence of the fevers being either the same or at any rate of their being very closely related to each other.

It is clear that the duration of the fever cannot be relied on to distinguish between dengue and sand-fly fever.

My personal view of the fever is that it is of the relapsing type and that in some epidemics the relapse is uncommon while in others it generally occurs.

The factors which influence the occurrence of the relapse may be (1) the virulence of the infective agent, and this may to some extent depend on the insect which is responsible for conveying the infection or on climatic conditions; (2) the presence or absence of partial immunity among the persons attacked.

THE RASH.

In diseases in which there is a characteristic rash great stress is rightly laid on this as a point in diagnosis, and for this reason much attention has been paid to the search for the rash in all cases where dengue is a possible diagnosis.

Two rashes have been described in dengue, the primary and the secondary. The primary is not really characteristic; it consists essentially of a flushing of the face and neck and chest, so that little stress is laid on it. Nobody claims that it will serve as a point of distinction between dengue and sand-fly fever; in fact, it appears to be equally marked in the two diseases, so that it may fairly be taken as a point in favour of the identity of the diseases.

The distinctive rash is the one that appears on the 4th to the 6th day; this usually comes with

the secondary rise of temperature when this rise occurs.

Nearly all the older writers lay stress on the rash; Manson and Scheube both say that it is usually present. In the Brisbane Epidemic it was said to be present in half the cases but sometimes doubtful.

Ashburne and Craig, in the Philippines say, that it was "often very faint, they *believe* that they saw it in 75 per cent. of the cases."

On the other hand in the Calcutta form of the disease (if this is admitted to be dengue) Rogers noticed it in only 7 per cent. of the cases, though he recognised only the "seven-day fever" cases as belonging to the clinical entity described by him.

Rogers' experience agreed closely with my own, and though it was in the interest of my contention to discover a rash in a larger number of cases, I never disputed Rogers' figures as to the incidence of the rash.

Cleland and Bradley say that the rash is often overlooked, "in several cases we could not make up our minds as to whether a rash was or was not present."

McCarrison never saw a rash in the Chitral cases, but it must be remembered that most of his cases were in Indians and consequently the rash would have to be very definite before one could be certain of its existence.

Wimberley saw a rash in about 8 per cent. of his cases.

Sarrhailhe and Delille both lay stress on the fact that the rash is present in certain outbreaks and absent in others, and there is little doubt that they are describing the fever ordinarily known as "sand-fly fever."

Most of the other accounts mention the occurrence of the rash in a few cases, but under the most favourable circumstances the rash of dengue is variable and evanescent and is often overlooked; further, it occurs usually with terminal rise, and it seems reasonable to expect that in the cases in which the terminal rise is slight or absent the rash may be correspondingly trivial or absent. If the rash is to be made the point on which the diagnosis rests, what will be said of the outbreaks in which the rash is present in 7 per cent. or even in 50 per cent. of the cases? Are only those cases in which a rash occurs to be considered as cases of dengue, while the remainder are cases of sand-fly fever? The truth seems to be that the rash of dengue is like the rash of typhoid fever in that stress can be laid on it when it is present, while its absence is of little value as evidence, for or against the existence of the disease.

If the duration of the fever and the rash are not reliable points on which to base a differential diagnosis nothing more need be said, for these

are the only points on which present-day writers rely for a distinction between the two fevers.

But my object is not to succeed in a controversy, but to ask for a serious consideration of the problem so that it is necessary to deal not only with the difficulties that others have raised but with any others that may occur to myself.

One such difficulty is connected with the insect-carrier of the disease. The insects that have been held responsible for carrying dengue have been *Culex* and *Stegomyia* mosquitoes; no one has seriously suggested the *Phlebotomus* as a possible carrier. Then, in connection with sand-fly fever, there is no evidence that there is any other carrier than the *Phlebotomus*, though some writers suggest a mosquito as the probable carrier. If it should be proved clearly that there are certain epidemics in which the mosquito is the sole carrier and that there are other epidemics in which the *Phlebotomus* is the sole carrier, it would be probable, though not certain, that we are dealing with two distinct diseases. Again, if it could be clearly proved that in some epidemics the one insect alone is *capable* of conveying the disease while in others the other insect alone is capable, the question would be settled almost as completely as if the virus had been isolated in each case and shown to be different.

More work is needed on the experimental conveyance of the infection of this disease from man to man by various insects. Apart from a few carefully conducted experiments, our knowledge is largely conjectural and in very few cases have proper controls been employed. What is specially wanted is a series of experiments in which both the *Phlebotomus* and the mosquito should be allowed to bite an infected person simultaneously, and then allowed to bite immune persons.

Another point of equal importance is to determine definitely whether one type of fever immunises against the other. If it does, there is a strong case for the unity of the two fevers; while, if it is found that no such immunity is produced, there is an equally strong case for the differentiation of the diseases. As has been pointed out already, such evidence as exists points to the short fever immunising against the longer and *vice versa*.

CONCLUSION.

Though at first sight it almost appears obvious that dengue and sand-fly fevers are quite distinct from each other, the evidence when analysed is by no means convincing. Until some reliable point of distinction between them is discovered, it is better to stick to the old term "dengue."

The terms three-day and seven-day may be added, if desired, to show the duration of the disease in any particular case, but they are not suitable as titles for the disease.

Even if the balance of opinion should be in favour of regarding sand-fly fever as being distinct from dengue, there can be no justification for giving a long separate account of the two diseases. The utmost that can possibly be said by way of description of sand-fly fever being something like this: "It is a disease which is either one of the modifications of dengue or is closely related to dengue. Those who consider it to be different from dengue say that it can be distinguished by the absence of a rash and by the absence of a secondary rise of temperature, though it must be admitted that in many outbreaks of undoubted dengue numbers of the cases show neither rash nor secondary fever. There is also a possibility that dengue is conveyed by a mosquito, while sand-fly fever is conveyed by a *Phlebotomus*."

If this is the utmost that can be argued by the "dualists" and if they will confine themselves to the above line of action, I have no quarrel with them. It is when they complicate the text-books and confuse students and practitioners by long and unnecessary descriptions that it is essential to issue a definite challenge to them.

A CIVIL SURGEON AT HEADQUARTERS IN UPPER BURMA.

BY J. ENTRICAN,

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Meiktila, Burma.

In a recent number of the *Indian Medical Gazette*, I tried to give some idea of the work of a Civil Surgeon "on tour" in Upper Burma, and the following is an attempt to portray his work at headquarters.

There are few posts in any profession where the work is so varied as that of a Civil Surgeon. He may specialize in one particular direction, but his daily work is as heterogeneous as the coloring of a "dazzle-painted" ship. This certainly adds to the interest of life, for there is something wrong with a man if he cannot find a hobby in some of the numerous duties of his daily round.

None of these, it is true, are likely to bring him either wealth or fame, but with the increased pay Mr. Montagu has promised us, he will be able to exist quite comfortably.

There are, of course, occasions when he will find himself in cordial agreement with that philosopher who defined life as "Just one d—d thing after another," but a sure remedy for this frame of mind is a tour in the jungle.

The day usually begins by a visit to the jail, with its population varying from one to eight hundred prisoners. The work is of a very routine character and the *Jail Manual* provides for almost every possibility. Some people

find it interesting, but I cannot claim to be one of them, nor can I enthuse over discharging the criminal, a fatter, heavier man than he was on admission. With all due respect to the department, I think this aspect of jail administration has been rather overdone. After all, the criminal owes a debt to the State, and the latter should see that he pays it, even if he does lose a few pounds weight in the process.

On the whole, prisoners are well behaved and give little trouble, most of their "crimes" being petty offences against jail discipline, as for instance when convict No. 555 is brought up before the Superintendent for laughing, and convict officer No. 303 for allowing convict No. 555 to laugh.

There are, of course, always a few rebels, born criminals, who have spent a large part of their lives in jail, but, generally speaking, prisoners accept their fate with placid indifference, and fall into the jail routine without a struggle.

The most interesting part of jail management is the utilization of labour. The garden employs a number of prisoners, but its possibilities have never been properly exploited. It might be used for experimental cultivation, under very favourable circumstances, but Superintendents have not the necessary expert knowledge, and in any case are always liable to transfer, so they rarely get beyond the growing of ordinary English and country vegetables. I once built a small septic tank in a jail garden; and experimented with it for two years, with complete unsucccess, but this can hardly be described as experimental cultivation.

The chief jail industry in this province is carpentry, but there are many subsidiary ones, such as blacksmithy, weaving, cane and bamboo work, rope-making, etc. In addition, the jail is the great repairing shop of the station, and no chief jailer worth his salt will ever admit that any job is beyond the powers of his workshop, and he can usually make his claim good. Here again, a great deal more use might be made of jail workshops, in investigating the industrial possibilities of the various woods with which Burma abounds. In the past, teak has been used for furniture, to the almost complete exclusion of other varieties. Perhaps now that it has become so costly, the humbler woods may get their chance.

Next comes the hospital. A few of these buildings are modern and up to date, but the majority of them show clearly their origin from small beginnings, and follow no known principle of architecture, being in fact a mosaic of additions and extensions clustering round the original building. Wood is universal in the older parts, but of late years brick has been coming more and more into use, owing to the rapidly increasing cost of teak.

One of the chief drawbacks of a Civil Hospital in the past was the lack of trustworthy intelligent supervision over the patients. The Sub-Assistant Surgeon, one of the hardest worked men in the province, had too many other duties to exercise more than a nominal control. The ward servants, ignorant and careless, receiving only a cooly's wage, were quite useless. Consequently the patients and their friends did very much as they pleased.

One morning I operated on a cataract and about an hour afterwards had occasion to visit the ward. I found the patient sitting up in bed, while a pal of his, a disreputable cooly, had taken off the bandage, and with two dirty fingers was pulling the eyelids apart, while he described to the patient what the eye looked like. That cooly left the ward hurriedly, somewhat after the manner of an empty kerosine oil tin caught in a "Dust devil."

On another occasion I operated on a badly depressed comminuted fracture of the skull. The comminution was so complete and widespread that the resulting hole in the skull was about the size of a wrist-watch. The same afternoon, while driving through the town, I met a squad of three policemen marching a prisoner with a bandaged head in the direction of the lock-up. Something familiar about the prisoner's face made me stop and investigate. It was my operation case of the morning, arrested for causing a disturbance at a *pué* the night before. We will draw a veil, or, perhaps better, close our ears to what followed. Nowadays things are better, though still leaving much to be desired, and incidents like the above not likely to occur.

The Burman has of late been taking up hospital work more than formerly. We have now a very excellent class of men called ward assistants, who have had a year's training in nursing, ward duties, dressing minor wounds, etc. They are in fact very much like what the Hospital Assistant was when he first started.

Burmese and Karen nurses are also coming to the front, and few hospitals of any size are without one or more. Their training still leaves something to be desired, but everything must have a beginning.

The menial staff is still largely Indian, but I believe in time these will be gradually replaced by Burmans. The ordinary Indian menial met with in this province is not generally a very favourable specimen of his race, and when the Burman has acquired a little more discipline and sense of responsibility, his substitution for the Indian will be a gain to all concerned. He has one priceless advantage, in being free from the trammels of caste, and is willing to turn his hand to anything. After living in Burma for some time, one is apt to get impatient with these

whims of caste and custom, especially as it is difficult to avoid the suspicion that they are sometimes used for the purpose of avoiding unwelcome work, as the following instance shows.—

At a station on the Irawaddy, the well water gave out during the hot weather, and supplies were obtained from the river, across two miles of deep sand. The water was carried in casks on bullock-carts, and the hospital *bhisti* had to go down to the river, fill the casks, and after arrival distribute the water. It was obviously impossible for one man to do all this, so four *dooly*-bearers attached to the hospital, and who had little or no work of their own at that particular time, were told off to go down to the river in rotation and fill the casks. But these men had other views on the subject, and, forming themselves into a deputation, intimated that they were engaged to carry a *dooly*, and it was contrary to all the laws of God and man that they should work as *bhistis*, and they declined to do it. The men were perfectly respectful, but their faces wore that mingled look of injured virtue and smug complacency which the Indian of the menial class assumes when he thinks he has got the Sahib "on toast." And for a moment the Sahib felt rather as if he were in that unhappy position; but a way of escape presented itself. Certainly they were engaged to carry a *dooly* and not to fill water-casks, but carrying a *dooly* required constant practice. In future, therefore, every morning and evening, they must carry the *dooly*, with the *bhisti* in it, down to the river, and when he had filled the casks carry him back again. Thus their bodies would be kept strong and their shoulders hard. This decision was received in silence and without enthusiasm.

Next day they valiantly trudged through the sand, morning and evening, carrying the *dooly* with the *bhisti* in it; but the following morning an humble and tearful deputation again waited on the Sahib. He was their father and mother, their one desire was to carry out his wishes, and filling water-casks a work in which they took particular delight. Would the Sahib be graciously pleased to order them to do it? After long and careful consideration, the Sahib was so pleased, and harmony again reigned, but he knew and they knew what convicted humbugs they were.

The Burman, especially the agriculturalist, is a shy bird and does not come to hospital, until several of his own *sāyās* (doctors) have tried their hands and failed. Consequently when he does arrive it is usually in an advanced and frequently hopeless stage of the disease. Cancer is fairly common, but one rarely sees it until all hope of operative interference is long past. It depresses and saddens one to be obliged so often to say, "I can do nothing, it is too late." The amount of pain, misery and discomfort these

people will endure, often for years, rather than be operated on, is extraordinary. One such case in particular sticks in my memory, on account of its tragic ending. A woman, of about 50, came to hospital, with a tumour on the neck, almost as large as her head. She had had it for 30 years but really could not put up with it any longer. Its removal was a comparatively simple matter, and when the wound was healed, she was given a looking-glass to see the results. Her delight knew no bounds. "Why, I'm quite good-looking now," she exclaimed. A delightfully cheery soul, she kept the whole ward in laughter with her quaint sayings, informing her hearers that now she was so handsome no one in the village would recognize her and half the men would want to marry her.

Finally she left the hospital, telling us she was going to stay a few days with some friends in the town, before returning home. Two days later she was brought back again to hospital, and this time—dying of cholera.

So she never got an opportunity of showing the people of her village what a handsome woman she had become.

Head injuries are amongst the commonest causes requiring operation, and they are usually brought to hospital by the Police. It does not require much to make a Burman "see red," and then he uses his *dah* with great vigour on his opponent's head, usually with very serious results, in the shape of extensively comminuted fractures of the skull. The Burman head, however, has uncommon recuperative powers, illustrating perhaps the survival of the fittest, through long generations of *dah*-using, head-whacking ancestors.

The bone may be in minute fragments with bits embedded in the brain, and a teaspoonful or two of the latter lost, but if you only get the case before septic meningitis has set in, you can almost certainly count on a rapid and complete cure. If the case goes wrong, it is because the fracture has extended to the base, and post-mortem examination verifies this.

The Burman is a sociable individual, loneliness is abhorrent to him. When sick, he likes to be surrounded by his relatives, friends and neighbours. This is one reason why he dislikes the hospital. One has to draw the line at 10 or 20 people, of both sexes and all ages, camping round his bed, and discussing in perfectly audible tones, the patient's chances of dying, and the funeral arrangements in case he does so. Nor does he believe in the proverb, that too many cooks spoil the broth, at all events as regards his health. Rather does he incline to the belief, that several forms of treatment, prescribed by different doctors, and carried out simultaneously, afford the best chance of hitting of a cure. He has also an abounding

faith in massage, and it is somewhat disconcerting to find a case of appendicitis, or enteric fever, subjected to a vigorous course of this treatment.

There is a good deal of medico-legal work at headquarters, Sherlock Holmes would revel in it. Death by various kinds of violence forms the bulk of these cases, and it is often a hopeless task to reconcile the story told by the prosecution and the story written on the victim.

In one case every particle of evidence including that of the dead man himself, for he lived long enough to make a statement, went to show that he had been shot while advancing towards the man who held the gun, yet the bullet had entered behind the right shoulder and passed downwards through the lungs into the abdominal cavity, where it remained. There was no exit wound. I have often wondered what really happened.

On another occasion the body of a girl was found in a tank near the village where she lived.

On the village side the tank was contained by a high bund and the water comparatively deep, while on the opposite shore the ground sloped very gradually down to the water's edge, with several yards of mud separating the two. The body was close to the bund while on the opposite shore, a single track was found leading through the mud into the water. The theory of her relatives and the Police (perfectly reasonable and in accordance with the available evidence) was, that the girl wishing to return to the village, and in order to save herself a walk of perhaps half a mile round the end of the tank, had tried to wade across it, but got out of her depth and was drowned.

On post-mortem examination, the lungs had not the appearance characteristic of drowning. Moreover the girl had received a severe blow on the side of the head, causing detachment of the meninges and hæmorrhage, but as the skin was unbroken this had been overlooked. Furthermore she had been violated after a severe struggle. In this case it was not difficult to piece together the tragedy.

Fearing no doubt that the girl's cries might attract attention, the ravisher either hit her on the head, or banged it against the hard ground, probably with more force than he intended. Then, finding she was either dead or unconscious, he had carried the body into the tank, thus accounting for the single track, and left it close to the bund where the water was deep, so as to create the impression that death was due to drowning. I regret to say this scoundrel was never detected, and one can only hope, that though he escaped human retribution, the avenging Furies marked him for their own.

Very occasionally the comic element creeps in, as when one villager having a grudge against

another, accused him of murdering a third villager, who had mysteriously disappeared some time before. The accuser pointed out the place where the body was buried, and a skeleton was dug up, which was forwarded to me for report. It was the skeleton of a calf minus the head. To complete this joker's discomfiture, the missing man turned up, and stoutly denied that he had ever been murdered. Seeing the game was up, number one confessed that he had buried the skeleton of the calf himself, and left out the head for fear it would give the show away. He quite forgot about the tail.

An important and engrossing part of a Civil Surgeon's work, is that of Health Officer to the Municipality, and this includes Executive as well as Advisory duties, for the lesson is soon learned, that if he does not himself translate the advice into action—no one else will.

Sanitary by-laws are looked upon as so much eyewash, which no self-respecting Municipality should be without, but any attempt to put them into practice is looked upon as a gross violation of the rights of the individual. The Burman will cheerfully give his consent to any sanitary by-law on the implied understanding that it will never be enforced against himself. This disregard of public rights when they conflict with private interests, is not unknown in England, but there is always enough leaven of public spirit to maintain progress. Here the leaven is non-existent, and the enforcement of by-laws for the benefit of the public at large is a never-ending struggle against inertia, evasion, and passive resistance.

As long, for instance, as a man can deposit his house refuse, solid and liquid, outside his own enclosure, he cares not what insanitary conditions are produced by so doing. I must say the worst offenders of all are amongst well-to-do Indians. They build *pucca* houses with projecting pipes in the side walls for the discharge of sullage water, without the slightest regard to where the filth falls, and think it a grievance when compelled to connect these pipes with a municipal drain.

The registration of vital statistics, vaccination, aerated water factories, slaughter-houses, bazaars, drainage, day and night conservancy, all require continual vigilance to keep the subordinate staff up to the mark.

Then there are the milk-sellers—those “dood-wallahs,” Indians all, and without exception the dirtiest, most conscienceless set of rascals that ever preyed on their fellow-men. Their ill-fed, neglected cattle give poor enough milk in all conscience, but the milk-seller is not content unless he can add at least 50 per cent. of water, and prefers dirty water to clean. The conditions under which these cattle are kept, contravene every known sanitary principle, and the only possible

way to effect any improvement is for the municipality to secure one or more sites on which all milch cattle should be housed. These sites properly laid out, drained and subject to frequent inspection, could be kept in a reasonably sanitary state. As long as the milk-sellers keep their cattle scattered all over the town and its environments, no improvement is possible.

I understand that here and there Burmans are beginning to take up dairying, realizing that the Indian has, up to date, been monopolizing a very profitable trade, and I hope this is true, for the Burman at all events feeds his animals properly.

Epidemics do not, as a rule, cause more than a ripple on the surface of Burmese life. The people are so accustomed to outbreaks that they meet them with an apathetic acquiescence which constitutes the chief bar to their eradication. The recent influenza epidemic is a case in point.

An exception must however be made in the case of plague, when it first reached this province.

Probably we ourselves, with our propaganda, disinfection, rat-killing and other paraphernalia, had something to do with this. Possibly the high mortality (at that time about 95 per cent.) was also a factor, but I believe the chief reason was the slow mysterious progress of the disease, which pounced now here, now there, like the witch-doctor “smelling out” his victims in one of Ryder Haggard's stories. “Small-pox we know, and cholera we know; but what is this?” asked the Burman.

The earliest victim was, as is so frequently the case, a bazaar seller, an elderly woman, without discoverable friends or relatives, so her burial was undertaken by the municipality. Slowly the disease spread through the town, and with it a gradually increasing dread, which aroused the people from their incredulity and apathy, but unfortunately only drove them into courses which were always futile and sometimes ludicrous. A deputation, headed by a somewhat truculent Burman elder, waited on the president, and solemnly informed him that the plague was due to the old woman, mentioned as having been the first victim, being buried with her head pointing in the wrong direction. They asked permission to dig up the body, in order to rectify this grave error, and were quite confident that by so doing, the plague would be stopped. Permission was accorded and the old lady's body duly re-planted in the correct position.

Surely the gods must have chortled to themselves at this exhibition of human folly, for they certainly showed a grim and impish sense of humour in selecting for their very next victim the daughter of the Burman who headed the deputation.

As the disease gained a firmer grip of the town, many of the inhabitants fled to the

surrounding villages carrying the infection with them. Trade came to a standstill and gloom settled on the deserted streets. At night numerous fires, casting a dull lurid glow, flickered in front of the houses, in the vain hope of preventing the entrance of the pestilence that stalketh in darkness. Bands of elderly men paraded the streets in slow and solemn procession, with beat of gong and chanting of prayers.

Yet nothing could exceed the obstinacy with which the people refused their co-operation, or the ingenuity with which they evaded well-meant orders, and in the light of more recent knowledge it must be confessed their prejudices had more justification than appeared at the time.

Disinfection was in those days one of the chief methods relied on to combat plague, but most of us recognized before long that attempts to enforce it did more harm than good. The dislike was so intense that it soon became the custom, before reporting a case, to strip the house of all moveables, and leave nothing but bare walls and floors to be disinfected. The various articles removed were distributed amongst friends and neighbours, and in this way no doubt infection was spread.

Rat-destruction has been lauded as a plague preventive, and no doubt it is in theory, but of all the dreams dreamt by sanitarians, this one of hoping to prevent plague in a Buddhist community by killing rats is surely the most fantastic and impractical. No doubt it is possible, at great expense in a limited area, and for just as long as the effort continues, to prevent plague by this means (though I know of no instance where it has actually been done), but taking into account the resentment engendered, I doubt if the game is worth the candle.

It is a trite and true saying that no measure of prevention can succeed without the co-operation of the people, but what co-operation can you expect from people who open traps to let the rats escape, or carefully sweep up and destroy poisoned baits?

The object to be aimed at is not to kill rats, but to prevent them living in close association with man, and this can only be slowly and laboriously achieved by permanent improvements in housing conditions and general sanitation, together with the gradual realization by the people that it is better and safer to keep their houses free from rats. Buddhist prejudices apart, I am very sceptical about rat-killing as a plague preventive. I find it impossible to imagine any practical degree of rat-destruction, which would appreciably reduce the rat population over any considerable area. The effort would have to be continuous; relax it for even a short period, and the rats would swarm in from all sides until their food limit was reached. Moreover, no discrimination can be

exercised: immune rats are killed as well as non-immunes, and the places of the former quickly taken by young non-immunes, with the final result that the new rat population as a whole is more susceptible to plague than the old one.

Of all the various methods advocated to stamp out plague, evacuation is the only one that has stood the test of time and experience, and has the supreme recommendation that it conflicts with no popular prejudice. Inoculation may be left out of account as a preventive, until the immunity conferred by it approaches, in length of time, that conferred by vaccination.

As ex-officio vice-president of the municipality, many duties of a non-professional character often fall to the lot of the Civil Surgeon, and some of these are distinctly amusing.

One morning a highly indignant Indian lamplighter came to the municipal office and retailed at great length the grievous wrongs he had suffered in the discharge of his duties.

The Burman small boy is, like other small boys, only more so, and one of them grasped the fact that a lamplighter at the top of a ladder was in an extremely bad tactical position, either for defence or for counter-attack. Collecting a band of kindred spirits, all armed with catapults, he opened rapid independent fire on that part of the lamplighter's anatomy where the back joins the legs. The amazed and indignant lamplighter came tumbling down the ladder vowing vengeance, only to find that his assailants had vanished. Every time he got to the top of the ladder, the same thing happened, and to cope with these Parthian tactics was beyond him. Loudly he clamoured for justice, expatiated on the agony he had suffered, and the exact position of his injuries.

Obviously such conduct could not be tolerated and a second man was sent with him the following evening to mount guard while he mounted the ladder. But the small boy was not thus easily defeated. A feigned attack and retreat drew the guard away in futile pursuit and left the unfortunate lamplighter undefended. Next morning two much injured men told the tale anew.

This really had to be put a stop to—so the Ward Headman was sent for and told that until he could guarantee immunity for the lamplighter, no lamps would be lit in his ward. It seemed rather a mean way of stopping such splendid sport, but the sanctity of the municipal employé had to be vindicated.

One morning a Burman came to the office and complained that an Indian shopkeeper had filled up the lane behind his house with empty boxes and completely obstructed the traffic, to the

great inconvenience of himself and his neighbours. The boxes were ordered to be removed.

A couple of days afterwards the Indian arrived on the scene, and complained that as soon as he had removed his boxes, the Burman had filled up the lane with bamboos and the obstruction was worse than ever.

It is just like dealing with a lot of impish children.

It has been a busy morning and I think it is now high time for the Civil Surgeon to go home to breakfast, so we will bid him farewell.

SCHISTOSOMIASIS IN INDIA.

By R. B. SEYMOUR SEWELL, F.A.S.B.,

CAPTAIN, I.M.S.

IN a paper recently published in the *Indian Medical Gazette* (April, 1919), Mr. F. Milton has put forward the view that human schistosomiasis is in all probability endemic in India and yet has hitherto entirely escaped the notice of medical men practising in this country. He has thrown down the gauntlet and has challenged us to bestir ourselves and to demonstrate and recognise the existence of this disease; to quote his own words: "*It is to be sincerely hoped that a great Medical Service*" [I presume that he is here referring to the Indian Medical Service!] "*will not endanger its reputation through leaving some outsider to discover that Schistosomiasis is among the common diseases of man in India.*" (The italics are mine.—R.B.S.S.)

The arguments that Milton brings forward in support of his view are briefly as follows:—

(i) India is situated within the zone in which schistosoma is known to flourish.

(ii) The conditions of race, occupation, and mode of life of the population are favourable to the spread of a parasitic disease such as schistosomiasis.

(iii) The necessary intermediate mollusc hosts are plentiful and widely distributed.

One cannot read Milton's paper without coming to the conclusion that his whole argument, in favour of human schistosomiasis being widespread throughout India, is based entirely on *a priori* reasoning without a particle of evidence to support it. He has dealt with the clinical and pathological aspects of the disease in other regions of the globe, but he has made no reference to its biological aspect, further than enumerating a list of species and hosts, nor has he given any summary of the life-history of the parasite, although this is now fairly well established by the researches of Katsurada in Japan, Leiper in Egypt, and others.

The parasitic schistosoma in its adult sexual stage lives in the abdominal veins, either the portal, mesenteric, rectal, or vesical veins, of

a warm-blooded animal, either man or some lower form: eggs are deposited in the tissues and escape out of the body in the various excreta by means of natural channels, such as the urethra or the rectum and anus. These eggs, if they are fortunate enough, on escaping from the body, to be deposited in or near water, hatch, and a ciliated larva, the "miracidium," makes its appearance; this larva then enters the body and finally comes to rest in the liver of a fresh-water snail. Not every genus, however, of fresh-water snail appears to be capable of harbouring the parasite; each species of schistosoma seems to have its own particular genus, in which it develops under normal conditions. Having obtained entry into a suitable mollusc host, the "miracidium" encysts and from the sporocyst there arise numerous 'cercariæ,' which leave the snail and pass out again into the water, and in their turn make their way into the body of a warm-blooded animal *viâ* the skin and subcutaneous veins, or possibly occasionally *viâ* the mouth, and on reaching the abdominal veins they undergo further development and become the sexually-mature adult worms.

From the above life-history it is evident that the study of schistosomiasis is not merely a medical or veterinary subject but is in great part a zoological one. *Schistosoma hæmatobium* (Bilharz.) has undoubtedly been introduced on many occasions in the past into India under conditions apparently favourable to its propagation, and occasionally the parasite may possibly have managed to complete its life-cycle in this country, thereby causing a fresh infection in man, though the evidence regarding such rare cases is not altogether above suspicion; but in any case it seems abundantly clear that this parasite has not and apparently cannot become endemic. The reason why this human-infecting parasite fails to secure a footing in India, if indeed this be a fact, may be found to depend on some factor inimical to its growth and development in its mollusc host, and not to be due to any inability to develop in man, for if the life-cycle be broken at any point, further development of the parasite becomes impossible. Milton has given a list of all the present known species of *Schistosoma* and has added a list of their "known" mollusc hosts, but he has unfortunately paid no attention to synonymy: for example, *Schistosoma magnum* (Cobbold) is generally regarded as being synonymous with *Sch. hæmatobium* (Bilharz); *Schistosoma reflexum* is, I understand, merely a term used in teratology: again *Bullinus alexandrina* is merely a synonym of *B. dybowskii*; and finally the correct name of the mollusc host of *Schistosoma japonicum* is *Hypsbolia nosophora*, the name *Katayama nosophora* being a synonym, while *Blandfordia nosophora* is an incorrect diagnosis. Milton has;

moreover, included in his list of mollusc hosts, the names of certain species regarding which the evidence is not convincing—I refer to the inclusion of two species of *Planorbis*, viz., *P. mareoticus* and *P. pfeifferi*, as being “known” hosts of *Schistosoma hæmatobium*.: *Planorbis mareoticus* is the host for an eyed-form of cercaria, probably belonging to a closely allied group of parasites, *Bilharziella*, but I know of no evidence connecting it with *Sch. hæmatobium*; and *P. pfeifferi*, though acting as host to a “tadpole” cercaria [the *Schistosoma* cercaria is of the furcocercous type] has given negative results in cases where attempts have been made to inject it with schistosome miracidia.

It would appear that each species of *Schistosoma* has an affinity in any particular region for a particular genus of mollusc and probably for a limited number of species in each genus. *Schistosoma hæmatobium* infects snails of the genus *Bullinus* with its sub-genus *Physopsis*, and in Egypt usually occurs in *Bullinus contortus* and *B. dybowskii*, though occasionally it may infect *B. innesi*; while in South Africa it infects *Physopsis africana*: *Sch. mansoni* normally infects *Planorbis boissyi*, and possibly *P. pfeifferi* in Egypt, *P. olivaceus* in Brazil and *P. guadelupensis* in Venezuela—as regards *P. ferrugineus* and *tenographilus* I understand that the infection experiments were only partially successful; and finally *Sch. japonicum* in Japan seems to infect only *Hypsbia nosophora*.

This brings us to the very important question of the necessary intermediate hosts in India: here the genus *Bullinus* is almost, if not entirely, non-existent, its sole doubtful representatives being the species *Physa coromandelica*, and *P. acuta* that was described some fifty years ago but has not been seen since; numerous species of *Planorbis* occur, but the only one that is widely distributed is *Planorbis exustus*; and the genus *Hypsbia* is, so far as we know at present, entirely unrepresented. Moreover, examination of the probable mollusc hosts in India has shown that they are already so heavily infected with Trematode parasites that the chances of yet another species being able to compete successfully appear to be small.

In India up to the present time four species of *Schistosomes* have been described, occurring in cattle, horses, sheep, etc., namely, *Sch. bovis*, *Sch. bomfordi*, *Sch. indicum* and *spindalis* and this latter species has recently been shown probably to pass through its asexual stage in *Planorbis exustus*. No trace of any endemic man-infecting *Schistosome* has as yet been recorded, and with four known species of animal-infecting parasites already in existence and thriving in this country, it is surely quite unnecessary for us to presuppose, as Milton

suggests, the existence of an entirely hypothetical fourth human-infecting form in order to account for the absence of the other three—to wit, *Schistosoma hæmatobium*, *mansoni*, and *japonicum*.

If schistosomiasis does occur in man in India, the parasite will almost certainly be found to make the veins of the portal system its normal habitat, and will, in the vast majority of cases, be associated with an excessive eosinophilia in the blood, but the only reliable guide to the diagnosis of this disease in the living subject is the actual finding of the eggs of the parasite in one or other of the bodily excreta; up to the present time such finding has only been recorded in this country in extremely rare cases, if we exclude those who have imported the disease from other regions, and though in recent years the search for the hook-worm has led to the systematic and thorough examination of the fæces of thousands, not a single case of rectal schistosomiasis in man has, so far as I know, been reported.

“We preach that we do know and testify that we have seen” and up to the present time no evidence has been brought forward that in any way indicates that schistosomiasis is wide spread in India; such evidence as we have is entirely of the negative kind.

I agree with Milton that we have in this country many different morbid conditions, which are grouped together and which in the present state of our knowledge we are unable to differentiate, but I cannot subscribe to his dictum—“It is almost certain that India will be found to harbour a new species of schistosoma, with a distinctive pathological entity depending on it.” Extensive research on both medical and zoological lines is required before we can hope to say definitely that endemic human schistosomiasis does not exist in India or that it cannot spread if introduced on a large scale from outside and the reputation of a great medical service would indeed be seriously endangered if we, in the present state of our knowledge, were to adopt a definite and final opinion one way or the other.

All that we can do is to follow the Asquithian dictum “Wait and see,” and for the moment regard the case against the schistosoma as “Not Proven.”

REMARKS ON THE INFLUENCE OF ABDOMINAL LESIONS ON THE RESPIRATORY SYSTEM.

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My attention was first drawn to this subject while investigating the changes in the respiratory movements in cases of abscess of the liver.

Since then I have observed the effects produced on the respiratory organs by such lesions as acute appendicitis, renal colic due to calculus, abdominal incisions for appendicitis or hernia, and other conditions involving trauma of the abdominal wall.

In all these cases a definite series of changes can be observed in the respiratory system, mechanical in nature and reflexly produced and remaining mechanical unless complicated by intra-thoracic sepsis such as, for example, the spread of peritoneal infection into the pleural cavity, when we have other factors introduced which complicate the ordinary course of events. In cases not complicated by intra-thoracic septic changes, we have to take into consideration two main factors, the first being the pain due to the lesion and the second the intra-abdominal pressure.

Let us consider the effects of the pain first:

In a case of acute appendicitis, for example, we have, as a result of the pain, an increase in the rigidity or tonus of the right rectus muscle, and to a certain extent of the oblique and transversalis muscles. This is reflex and protective, and produces, by immobilising the affected and painful area, a diminution in the pain. As soon as the rigidity is sufficiently pronounced for detection by palpation, a careful examination of the chest will demonstrate

- (1) a diminution in the movements of the right chest wall;
- (2) a diminution in the intensity of the breath sounds over the right base;
- (3) a diminution in the range of movement of the right half of the diaphragm; and,
- (4) possibly a slight elevation of the right half of the diaphragm.

As the pain increases all the above changes become more and more marked, and in a few days slight dulness, accompanied by a few moist sounds, may be made out over the right base. In the absence of definite sepsis in the pleural cavity the case does not progress beyond this stage.

The removal of the appendix does not immediately do away with the signs in the right chest; in fact, the pain caused by the incision together with the effects of the anæsthetic may actually aggravate the condition, and as long as the incision remains painful, the respiratory organs will not be restored to the normal.

We have all seen cases where a healthy appendix has been removed when the patient really had a patch of pneumonia, which had been overlooked, in the right lung. This is a question of referred pain misleading the surgeon.

In this article we are dealing with the reverse process, and I wish to point out that thoracic signs of the type described above, following on or discovered after an operation, must not lead the

surgeon to assume that he has made a wrong diagnosis and that the appendix was not the cause of the trouble, when only slight changes can be detected in the organ after its removal. Naturally, the increase in the thoracic signs for a day or two after the operation still further tends to confirm his suspicions concerning the correctness of the diagnosis.

The same sequence of intra-thoracic changes follows in the other abdominal conditions I have mentioned above, and in fact in any condition which gives rise to unilateral pain, provided the pain is sufficiently intense to cause reflex rigidity of the abdominal muscles on that side, and so mechanically restrict the movements of the chest wall.

Let us next take the second factor, *viz.*, the intra-abdominal pressure:

This is well illustrated in cases of abscess in the right lobe of the liver.

We have in the early stages a diffuse enlargement of the liver accompanied by a slight elevation and a diminution in the range of movement of the right half of the diaphragm. There are also changes in the movements of the right chest wall and in the lung, of the type described above.

As the abscess develops and enlarges, the elevation of the right half of the diaphragm increases and its range of respiratory movements diminishes until it ultimately comes to a standstill at about the level of the third rib or space.

At this stage the right lung shows slight dulness and a few moist sounds over the base and diminished breath sounds over practically the whole lung.

To a large extent the above changes are produced by the actual size of the liver, but the rigidity of the abdominal muscles, reflexly caused by the pain, is also a contributory cause.

The changes in the position and movements of the diaphragm can be easily followed by simply screening the case, and in fact an X-ray examination is of the utmost importance in determining the size and position of the liver abscess, apart from the information gained by observing the behaviour of the diaphragm.

The elevation of the diaphragm cannot be entirely due to the mechanical increase of pressure below, because, if that were so, then the diaphragm ought to get more and more tense as the size of the liver increases. But this is not the case. In fact the right half of the diaphragm is relaxed. So there must be a reflex inhibition of the tonus of this half, and this accounts for the fact that the elevation terminates abruptly near the middle line, the left half retaining practically its normal level, even when the right is raised 4 to 5 inches.

This relaxation also explains the unilateral elevation and diminution in the range of movement in such conditions as appendicitis, incisions

and other unilateral abdominal lesions where the increase of pressure is very slight.

Another phenomenon, which I could not account for in the first few cases of liver abscess I operated on, becomes easier to understand in view of the existence of the above changes.

It was observed that in large liver abscesses operated on transthoracically, after resecting a piece of rib and opening the pleural cavity, no inrush of air took place in those cases where no adhesions existed between the parietal and diaphragmatic layers. This could only be explained by assuming that the lung does not collapse when air is admitted into the pleural cavity, or else, that the lung had already collapsed before the operation.

As a matter of fact, we know that immobilisation of one side of the chest for a few days tends to produce gradual collapse of the lung, and in fact, I found the lung well retracted beyond the reach of my finger in all cases of large liver abscesses of some days' duration, and the resection of the rib and the opening of the pleural cavity could produce little or no immediate effect on the already retracted and collapsed lung.

Moreover the recovery of the lung in these cases, although the pleural cavity is completely shut off by adhesions in the first day or two after the operation, takes several weeks before it is complete, whereas the healthy lung accidentally allowed to collapse in a case in which a piece of rib was used for grafting purposes, took only 48 hours before expanding to the full extent of the pleural cavity. This is naturally to be expected, as a lung which slowly collapses adapts itself to its diminishing size and undergoes definite structural changes, whereas a sudden collapse of a healthy lung leaves the organ in the best condition for a rapid resumption of its original size and shape, as soon as the pleural cavity is rendered air-tight.

So we see that the pain accompanying a unilateral abdominal lesion reflexly produces an increased tonus in the abdominal muscles of that side and this mechanically restricts the respiratory movements of the chest wall. There is also a restriction of the movements of the corresponding half of the diaphragm and a diminution in its tonus allowing it to be easily elevated if any increase in the intra-abdominal pressure should co-exist. In fact, the increased pressure produced by the increased rigidity of the abdominal muscles is sufficient to produce detectable elevation, in a case of appendicitis for example.

This unilateral diminution in the activity of the chest wall and diaphragm, if progressive, causes changes in the lung, leading ultimately to complete collapse, if the thoracic and diaphragmatic movements are brought to a standstill.

Physiologically the anterior and lateral abdominal muscles are antagonistic in their action to the diaphragm, and we know that an increase in the tonus of a particular group of muscles produces a corresponding inhibition of the tonus of the antagonistic group.

The behaviour of the diaphragm in the conditions I have described above is only what, after all, one has a right to expect.

In bilateral abdominal conditions, such as ascites, uterine fibroids, cystic swellings, etc., two main facts have to be kept in mind in estimating the effects they are likely to produce on the respiratory organs, *viz.*—

(1) that most of these bilateral conditions are not accompanied by any marked degree of pain, and so the influence of a reflexly increased tonus in the abdominal muscles does not come into operation ;

(2) that bilateral changes in the lungs of the type described above prove fatal long before complete collapse of both lungs has occurred.

In conclusion, I wish to thank Lieutenant-Colonel Brian Watts, D.S.O., for permission to publish this article.

A Mirror of Hospital Practice.

CALCULI OF THE PROSTATE.

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I HERE report three cases of calculi of the prostate: one in which two calculi were present; another from which twelve faceted calculi were removed, and a third with forty-six seedling calculi.

Prostatic calculi usually occur in middle life and old age. In the three cases that have so far come under my notice, the largest stones occurred in youths of nineteen and twenty, and small calculi in a man of thirty-five.

As to the origin of prostatic calculi we know that, though lodged in the region of the prostate, they may have three modes of origin and formation:—

1. They may be formed in the *substance of the prostate gland* itself. They have then as their basis the corpora amylacea with varying amounts of calcium phosphate and carbonate deposited round them, giving rise to stones varying in size from grains of sand to large calculi.

2. They may be formed in *pouches*, congenital or acquired, that communicate with the prostatic urethra, catching up deposits from the urine and eventually forming stones that are more or less the moulds of the pockets that lodge them.

3. They may have their origin in the *kidney* or *bladder* and become lodged in the prostatic urethra secondarily where successive phosphate deposits cause an increase in their size and mould them to the shape of the passage or diverticulum that gives them lodgment.

I shall now give the accounts of my cases and comment on them later.

CASE I.

Two Prostatic Calculi and one Vesical Calculus.

P., a highly neurotic Singhalese, aged 20, was admitted into the General Hospital, complaining of the following symptoms: Frequency of micturition (about ten times during the day and about fifteen times at night, giving him little sleep). Micturition was accompanied by a burning sensation, especially towards the end of the act, when he experienced a scraping sensation, beginning at the anus and ending at the meatus. In spite of severe straining the stream was thin and weak, and the last few drops contained a thick white precipitate—phosphates. Micturition was most easily accomplished when he lay on his side, but was almost impossible when standing, owing to sudden blockage and interruption of flow. This effect was no doubt contributed to by the loose stone I subsequently found in his bladder. During the day, therefore, he found it easier to micturate sitting on his haunches (a method much in vogue amongst the natives here). Micturition under the best of circumstances was torture. I saw him lying on his side straining prodigiously, groaning in agony, and pressing with his fingers forcibly on the perineum, and the result of all was a thin feeble stream of urine rapidly passing into a few drops, which soon ceased.

There was dribbling in the intervals of micturition, but the bladder was not distended. He sometimes felt a small foreign body move in the fossa navicularis (referred sensation). He never passed blood or stones per urethra: but has often noticed white pieces like "cocoanut scrapings" in his urine. There were no genital symptoms. This state of things had been going on for ten months.

The patient had undergone twelve months' imprisonment in a Ceylon gaol, from which he was released only three months ago. In gaol he had done hard labour on a diet of rice, coffee, dry fish, hard bread, and meat. After one month's imprisonment he received lashes. He had hardly been three months in gaol when he noticed the first symptom of his disease, namely, frequency of micturition.

On making a rectal examination, which I had to do under anaesthesia, owing to the severity of pain, I felt the grating of two stones lodged in the region of the prostate, and confirmed this on

passing a sound, when I also detected another stone lying loose in the bladder. Prostatitis and deferentitis were present.

Operation.—I performed suprapubic cystotomy and removed three stones—one from the bladder 3.2 cm. long, and two from the prostatic urethra, 2 cm. and 1.4 cm. in their longest diameters, respectively. I found the bladder wall very attenuated. The prostatic stones I reached by passing my finger through



the internal meatus, and extracted them with scoop and finger, aided by a finger in the rectum, without very much difficulty. They were situated about $\frac{1}{4}$ in. from the neck of the bladder; the semilunar stone was removed first. These stones were faceted for articulation with each other, and, as will be seen from the diagram, are not unlike the scaphoid and semilunar bones of the carpus. The stones were composed of phosphate and calcium carbonate.

I did not keep in a rubber catheter at the time, and regretted it afterwards, as I was only able to do so after dilating the urethra with sounds a couple of days later. I corrected his phosphaturia with urotropin, acid sodium phosphate, and a bitter infusion.

In three weeks the patient left hospital with no unpleasant symptoms and quite cheerful.

Certain points in the case call for remark.

Casper favours the pre-rectal route in the extraction of prostatic stones; I think I was well advised in having adopted the suprapubic approach in this case.

Judging from the contour of the two prostatic stones, their accurate adaptation, and the presence of phosphaturia, I think the conclusion that these stones were formed primarily in the prostatic urethra justifiable. I am inclined to believe that the narrow portion of the bigger stone projected into the membranous urethra, the narrowest portion of the passage; it is significant that this constricted part measure 1.2 cm., the length of the membranous urethra.

The overwork, anxiety, intimidation, and bad food inseparable from the life of a convict seem to have been the causative factors in the production of the phosphaturia and calculi. At any rate, the symptoms began only three months after he went into prison.

Pressure on the perineum was an aid to micturition, serving probably to cause a slight dislodgment of the calculi. The feeling of a foreign body in the fossa navicularis was a referred sensation. Difficulty of micturition when standing was an effect of the action of gravity on the prostatic stones, whilst the sudden blockage to

the urinary flow must be attributed to the vesical stone.

Dribbling in the intervals of micturition is attributable to the inability of the prostatic sphincters and the compressor urethrae to act, the latter probably owing to the intrusion of the narrow neck of the lower stone within the membranous urethra. In other words, there was mechanical incontinence of urine.

CASE 2.

One Vesical Calculus and 12 Prostatic Calculi removed by suprapubic cystotomy; subsequent perineal drainage.

W., 19, male, Singhalese, agricultural labourer, was admitted into the General Hospital, Colombo, on the 5th September, 1912, complaining of great difficulty in micturition, accompanied by a burning sensation in the urethra during the act, and of pain in the hypogastrium and penis at all times, but worse at night. He was in a highly nervous state and was continually trembling.

The present symptoms began with a white urethral discharge and burning pain, which he noticed for the first time about one year ago. He denied ever having had sexual intercourse. The symptoms continued in greater or less degree until the present time. When he came under observation micturition was very scanty and accompanied by a severe burning sensation all the way down the urethra. By dint of much straining he has been able to squeeze out a few drops of urine at frequent intervals, about 10 times during the day and 10 to 12 times during the night. A purulent urethral discharge was present, which on microscopic examination proved to be free from gonococci.

On digital examination per rectum the prostate felt stony hard, was slightly crepitant, and very painful; this at once settled the diagnosis. Further on exerting pressure on the prostate a drop of sero-purulent discharge appeared at the meatus.

Examination of the urine.—Sp. gr. 1015; alkaline; slight trace of albumen present; there was no evidence of blood; phosphates, pus, and epithelial cells were present in abundance; no gonococci in centrifugalised deposit.

Operation.—On the 10th September, 1912, a sound was introduced into the bladder without much difficulty, and a grating sensation was communicated to the hand from the region of the prostate; this confirmed the diagnosis already made; also a characteristic click told of a calculus free in the bladder. Through a suprapubic incision a stone, a little smaller than a hen's egg, was removed from the bladder; and by means of a finger passed through the bladder meatus, aided by a finger in the rectum, no less

than 12 faceted stones of various shapes and sizes (see fig. 2) were extracted from the prostate, which was found to be tightly packed with them; removal of the first was a somewhat difficult matter, but after that there was not very much difficulty with the rest; they were all removed by the index finger without the aid of scoop or forceps. A large rubber drainage tube was passed into the bladder and a gauze strip to the fossa of Retzius. The patient's condition after the operation was grave and showed signs of profound shock, from which he rallied under saline proctoclysis, warmth, etc.

Progress.—The temperature varied from 97°F. to 103°F. for the next twenty-two days, during which time he was given urotropine and acid sodium phosphate. There was a tendency for pus to accumulate in the prostatic cavity left by the removal of the stones: this was overcome by massage per rectum combined with urethro-vesical irrigations by means of a short nozzle, the irrigating fluid finding an exit in the suprapubic wound. These measures however proved insufficient and the temperature kept up. On the 2nd October, the urethra was dilated with sounds and a quantity of encysted pus was liberated from the prostatic region. On the 12th October, the temperature still keeping high, a catheter was again passed, under an anæsthetic, and a large quantity of pus was again liberated from the same area. As the temperature still kept up and as the patient was now in a rather low condition, he was anæsthetised for the third time and perineal drainage of the prostatic pouch was established. After this his condition improved, but his temperature still continued fitful. On the 24th November a para-vesical collection of pus was evacuated, under anæsthesia, by reopening the supra-pubic wound, which had quite healed by this time. From then onward recovery was uneventful but slow, and except for urethral dilatations on four subsequent occasions nothing more was done. The patient left hospital quite recovered from his prolonged illness and without fistulæ. I have lost touch with him since then.

Description of Calculi.—The vesical stone measured 5.3 cm. × 2.5 cm. It was rough and spiculated on its surface, as rapidly growing phosphatic calculi often are. It was laminated, the outer laminae fracturing easily in flakes.

The prostatic calculi were 12 in number. Two of the largest measured 2.2 cm. by 1 cm. and 2 cm. × 1.8 cm., respectively. The smallest was 7 mm. One was almost as round and smooth as a small marble, but it too, like the others, bore the faint but distinct marks of two facets. The rest were of various shapes and sizes; they fractured easily, and carried different-shaped facets, many of which were saddle-shaped. One of them presented as many as 4 facets; several contained 3 or 2; even the smallest had at least

one acet. They were somewhat rough on their non-articular surfaces. Some fractured fairly easily, others were harder and more compact.

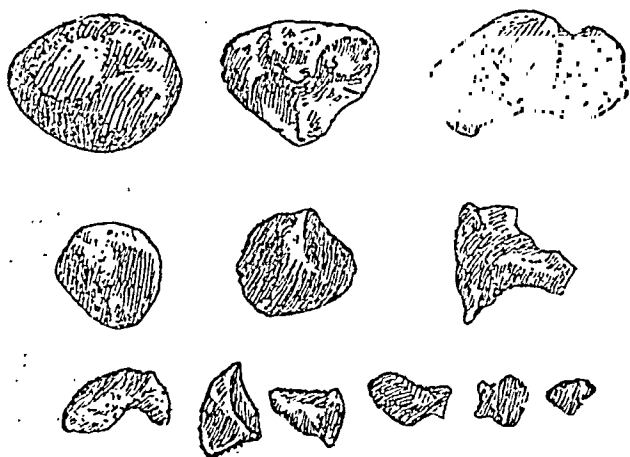


Fig. 2.—Twelve Prostatic Calculi showing facets. Natural size.

When dry they presented a mottled appearance; and were stained a patchy light yellow.

Chemical composition of the calculi.—The vesical calculus and one of the prostatic calculi were sent to Mr. C. T. Symons, to whom I am indebted for the following analysis:—

The vesical calculus consisted of a dense inner core, which contained mostly urates with some calcium phosphate. The next layer, which was looser, contained the same mixture but not so much urate. The outer loose layer contained calcium phosphate with a trace of calcium carbonate, but no urates.

The prostatic calculus was composed in its central part largely of urates; the outer portion contained in addition a considerable proportion of calcium phosphate.

Comments.—Judging from the history of this case I am inclined to think that the large stones shown in the figure were formed primarily in pouches communicating with the prostatic urethra. This form usually occurs in young men. The case previously reported by me also comes under this category. What the origin is of the pocket that predisposes to this stone formation, it is difficult to say; perhaps in this case it was congenital in the first instance, and then as the stones gradually formed they excavated for themselves roomier recesses by irritation round stagnating deposits, thus preparing the way for further deposits and faceted calculi. Chronic abscesses of the prostate may, it is true, open into the urethra and create a pocket in which a calculus may lodge or form; but there is no reason to suspect such an origin in this case, as there was no antecedent history of prostatic trouble; his earliest symptoms were urethral discharge and a burning sensation on micturition, which were no doubt the result of calculus irritation and not the cause of their formation. The composition of the core of the prostatic

stone (urates) may suggest the view that a renal calculus formed the nucleus of the stone, but there is no evidence to support this in the absence of preceding symptoms of renal colic or discomfort. There is surely no reason why calculi having other composition than phosphates or carbonates should not be formed lower down the urinary tract than the kidney; a recess opening into any part of the urinary channel, or the part immediately behind a stricture, is quite capable of catching up or filtering of *any* urinary sediment whether organic or mineral. The view that obtains with some that only phosphatic stones are formed *in situ*, and that urate, uric acid, and calcium oxalate stones found in diverticula must necessarily come from above, does not seem at all feasible.

If we look at the symptoms in this case we find that the main ones were,—Great frequency and pain on micturition, and a purulent urethral discharge. The *highly nervous state* of the patient was also a striking symptom, which I noticed in my previous case; it is due as much to pain and loss of sleep and rest as to the peculiarly unnerving nature of prostatic stimuli. The evidence of this case seems to point to the conclusion that stones may form in the prostate and give rise to no great symptoms until secondary infection or projection of the calculi into the urethra or against the vesical neck cause symptoms of urgency.

The diagnosis of these cases would not be difficult if one kept in mind the possibility of their occurrence, and made routine rectal prostatic palpation a rule in the examination of all genito-urinary cases. It is on the rectal feel that the diagnosis is made, and this may be confirmed by the sound only when the stone projects into the urethra. The X-ray is of course invaluable.

As regards the operation performed in this case I was no doubt ill-advised in the choice of my route. The tardy convalescence, and the need for operative interference on four separate occasions proves conclusively that the perineal route should have been the route of choice in this instance, as it would have afforded the best means of draining the prostatic pouch and diverticula left, after removal of the stones, in which fetid urine and pus collected and caused infection to spread along cellular planes, giving rise to para-rectal and para-vesical abscesses.

CASE 3.

Forty-six seedling Calculi of the Prostate, combined with urethro-rectal and other fistulae, and strictures of the penile and bulbous urethra.

S. A. 35, male Singhalese, cultivator, came into hospital on the 31st January, 1914, complaining of great difficulty in micturition; he had also two urinary fistulae. There was

frequency of micturition to the extent of about eight times during the day and five to six times at night. Whenever he urinated there was also an inclination to defecate; he sometimes felt that urine dribbled through the anus. Micturition was most easily accomplished by resting on one or other buttock, especially the left, and coaxing the urine out by stroking the skin at the peno-scrotal junction. Even at the end of the micturition he never felt that he had completely emptied his bladder. Whenever the inclination to micturate was strong there was some incontinence, the urine flowing out in drops at the fistulæ and meatus.

He states that for the last three years he has not had seminal emissions during coitus, an act which he is however capable of performing. He is the father of a child aged four years but has had no children since then.

His present illness dates from 12 years ago, when he had an attack of gonorrhœa which lasted for about 18 months, and was complicated by a left epididymitis, which terminated in a small focus of suppuration. This attack left him with disordered micturition, there being great frequency (at one time almost hourly) and considerable difficulty in passing water. He states there were times when each act lasted about half an hour. Some months ago there was a profuse discharge of pus through the rectum.

Operation—was performed on the 18th February, 1914. A Wheelhouse's operation was done as the bulbous stricture was an impassable one. There was also a penile stricture and a prostatic urethro-rectal fistula. The scrotal and perineal fistulous tracks were dissected down to the urethra and removed. On inserting a Wheelhouse's probe into the bladder a sensation of grittiness was communicated to the hand. This led to the discovery of a large number of minute stones. Forty-six stones were removed with a scoop—the largest were about the size of grape seeds, the majority about the size of cardamom seeds. A rubber catheter was passed from the external meatus into the bladder and tied in. The urethra was partially mobilised and the deficiencies left in it by the dissection of the fistulæ were repaired with cat-gut. No attempt was made to dissect up and suture the recto-urethral fistula as manipulation was difficult in the position it occupied, namely in the prostatic region. The patient left hospital six weeks later relieved of his symptoms but with the urethro-rectal fistula still persisting.

Description of the Calculi.—Forty-six were removed in all, a few being probably left behind. Four or five of the biggest were about the size of grape seeds, the others averaged about half the size. They were smooth and of various shapes; some were rounded, most flattened; the majority

were more or less faceted. They came away in clusters cemented together by a glutinous material. It was difficult to say whether they occupied separate pockets or were agglomerated together in a single one.

Mr. C. T. Symons' report on one of the largest of these was as follows. It consisted mostly of calcium phosphate with a trace of another compound, probably oxalate. It contained no urates.

Comments.—This was a case in which antecedent gonorrhœa seemed to play an important part. There were strictures and fistulæ; there was undoubted evidence of persistent infection of the prostate as shown by epididymitis with suppuration and the fact that a prostatic abscess burst years later into the rectum, establishing a recto-urethral fistula. In the infected prostate and the recesses left by foci of suppuration in it seedling calculi, the so-called true prostatic calculi, formed.

As to the mode of formation of these calculi, and their relation to the corpora amylacea, it may not be out of place to summarise some views. Corpora amylacea are found in various organs of the body. Thompson says they are always present in the prostate after the twentieth year, scattered throughout the gland, chiefly in the ducts about the verumontanum; in one prostate several thousands were present. They are microscopic as a rule. Their colour is a light yellow, growing darker with age. Although like small uric acid calculi, they are not of urinary origin. Ziegler says they are due to degeneration of epithelial and connective tissue cells; others say to stagnation of gland fluid, calcified glandular epithelium, etc. Posner classes them as calculi, and English shares Posner's view, and says that a final cause of their formation is possibly a microbic invasion of the gland. The small bodies are mostly organic and the larger chiefly inorganic. According to Thompson, the corpora amylacea, having attained the size of their enclosing follicle, act as foreign bodies, and in consequence of the general law, that all mucous membranes when sufficiently irritated throw out a deposit of calcium phosphate and carbonate, they ultimately form calculi; the earthy matter contained being from 45 to 85 per cent. They are associated with glandular hypertrophy and peri-acinous round-cell infiltration; pressure atrophy may cause entire disappearance of the gland with the exception of the capsule. English points out that the paucity of symptoms is in striking contrast to the wide extent of disease in the gland, hence the great importance of physical examination. The complications apt to arise are abscess, fistula, incontinence or retention, and sexual disorders.

To return to the present case. On surveying the condition of things, we see that in addition to the prostatic calculi there were two strictures

and several fistulæ present. The symptoms therefore should be warily interpreted as those caused by the calculi are almost hopelessly obscured by the other conditions. Most of the symptoms recorded were no doubt due to the strictures and fistulæ rather than to the prostatic stones.

The absence of seminal emissions may have been due to,—1. Occlusion of the common ejaculatory ducts by the prostatic abscess and stenosis of the vas and ducts of the epididymis on one side at least—the left, where an abscess is said to have formed. It is significant that there was no atonic impotence so often associated with chronic prostatitis.

2. The presence of urethral strictures and fistulæ: these are of themselves sufficient to prevent any seminal fluid present from appearing at the meatus. The fact that a son was born to him about eight years after his initial attack of gonorrhœa and epididymitis is proof that the ducts from the testicle were not completely destroyed or occluded before that time. The events that occurred after this were (a) the prostatic abscess, which burst into the rectum, and (b) the gradual tightening of the urethral strictures. It is, therefore, probable that the prostatic abscess was responsible for the absence of seminal emissions by destroying and occluding the openings of the ejaculatory ducts or by directing what little seminal fluid there was down the fistula into the rectum, the impassable bulbous stricture helping in this.

SPECIFIC FEVER OR SYPHILITIC SEPTICÆMIA.

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I WISH in the following note to draw attention to a somewhat neglected aspect of syphilis. It is, of course, well known that syphilis is often accompanied or complicated by a rise of temperature: the early periods of the disease—that of sore throat, glandular swellings, eruptions, etc., not uncommonly so. In cases of this type one has usually something definite to base the diagnosis on and the fever is not regarded as of any great importance.

In several cases that have come under observation during the last year or so, in hospital and in private, the outstanding feature was the fever without any of the usual manifestations of syphilis and often without any history of a primary sore or even a secondary rash.

Three examples of this type are described below, but many more might be put on record as the condition is not at all uncommon.

CASE I.—European male, aged 35, unmarried, was admitted for fever and headache on the 24th July, 1918.

History: The patient had enteric fever in 1907 whilst in German East Africa. He denies all history of syphilis, but admits that he had gonorrhœa. In 1915 and 1917 he had severe attacks of malaria (so called), also dysentery.

For the year previous to his present admission to hospital he has suffered from fever, rising to 103°F. or 104°F. Occasionally breaks of two or three weeks in the fever occurred. The fever was accompanied by considerable prostration and general weakness and there was a continual headache, whether fever was present or not.

The patient during this year was treated in German East Africa, in Egypt, in Bombay, and in other parts of India. In fact he spent most of his time in different hospitals with very little benefit.

When admitted into the Medical College Hospital in July, 1918, the patient was in a serious condition, the headache was severe and, as will be seen from the chart, he was running a septic type of temperature.

All the usual remedies were tried and failed to do any good; also the ordinary clinical examinations of the blood, urine, sputum and X-ray examinations of the chest and abdominal organs failed to throw any light on the cause of the fever.

As malaria, coli bacilli, tubercle, etc., were all excluded, we arranged for a Wassermann reaction to be carried out and, as soon as the blood was taken, put the patient on anti-syphilitic remedies. To our agreeable surprise, the temperature fell to normal within 48 hours and his condition gave us further trouble. A few days afterwards the result of the Wassermann reaction was received, which was markedly positive.

He was given a full course of anti-syphilitic treatment, which he still continues. Seen nine months afterwards, he is in good health; has had no return of the fever and has never had a headache since leaving hospital.

CASE II.—Wangloom, a Chinaman, aged 35 years, was admitted for fever. The ordinary methods of clinical examination failed to reveal any cause for the patient's condition.

No history of specific disease could be obtained, but there were some scars on his legs which were suspiciously syphilitic in appearance.

Having excluded the more common causes of fever, this man was placed on anti-syphilitic treatment. In a few days his temperature came down and his general condition improved most remarkably.

One feature exhibited by both these cases, and one also which is very commonly seen in such cases, is the very great improvement that takes place in the physical appearance and the general condition of these patients, when specific treatment is pushed.

These two men after a few days' anti-syphilitic remedies passed from a weak, febrile condition and a dull, stupid appearance to comparative health.

Case I was very weak and greatly prostrated, yet as soon as the temperature came to normal and the headache disappeared, he very quickly regained his strength and vitality.

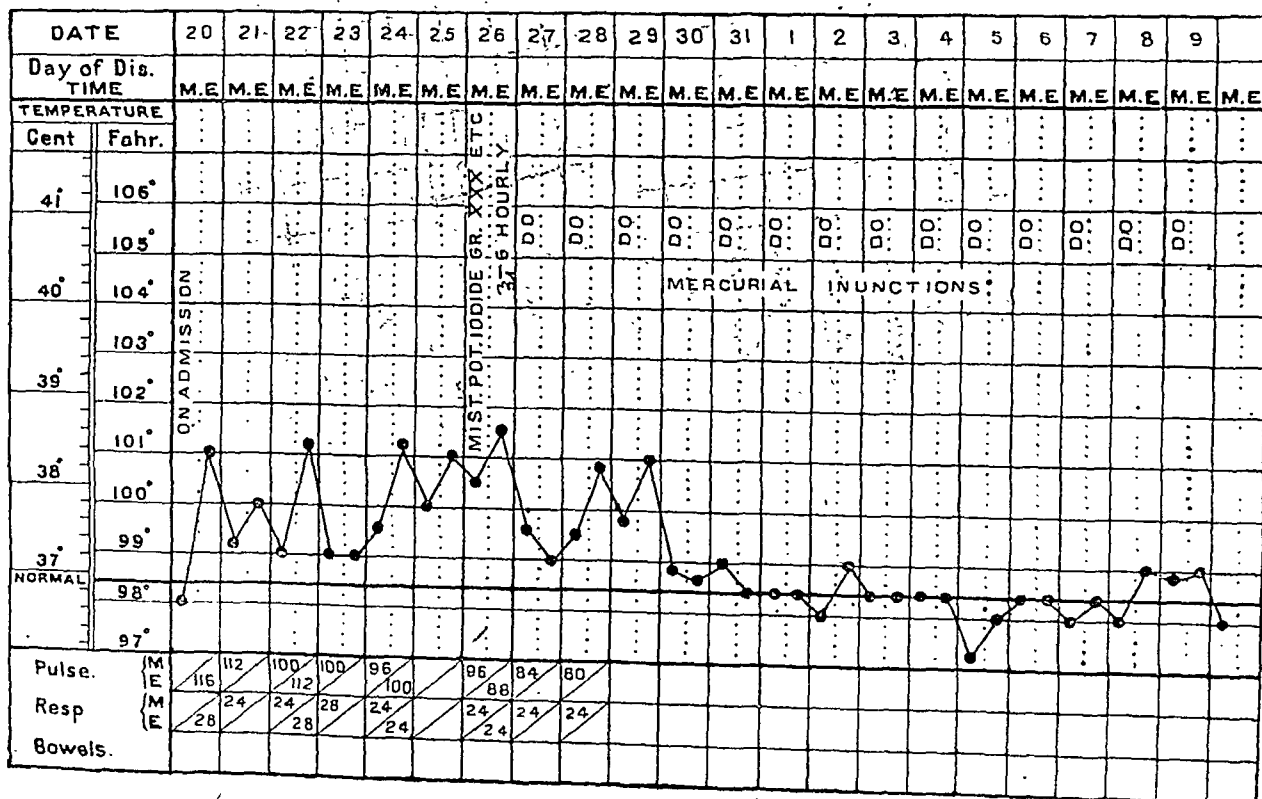
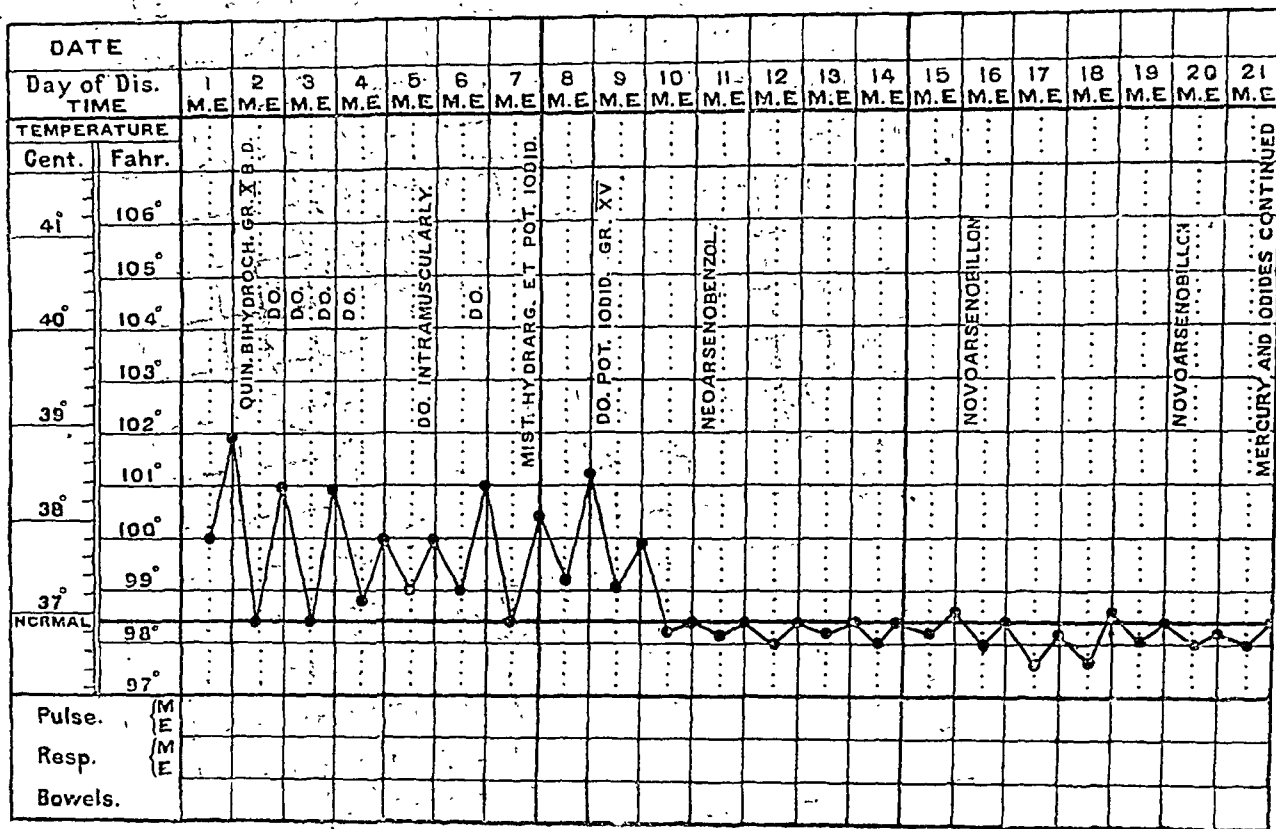
CASE III.—M. Prosad, Hindu male, aged 50 years, was admitted into the Medical College Hospital for irregular fever, which had been running on and off for over two months. The spleen was slightly enlarged, about one finger from the costal margin; nothing abnormal noticed in the lungs nor in the heart. There were no malarial parasites in the blood nor was there any leucocytosis. He was put on an ordinary diuretic and diaphoretic mixture and quinine bichloride in adequate doses. The temperature went on for four days, had a remission on the fifth day, but went up again after twenty-four hours.

We stopped his quinine and put him on potassium citras to make his urine alkaline, just to eliminate the possibility of a B. coli infection. The urine became alkaline in twenty-four hours, but the fever went on irregularly. Then we started injections of soamin. He had five injections of soamin without any marked effect on the temperature. We then sent his blood for Wassermann test and gave him an intravenous injection of 0.3 gm. of novoarsenobillon. The temperature settled to normal in three days and kept normal for nine days after the injection when the patient left the hospital. We got the blood report in due time; it reacted moderately to Wassermann reaction. The patient was put on potassium iodide (one drachm twice a day) one week after the injection of novoarsenobillon.

SPECIFIC FEVER OR SYPHILITIC SEPTICÆMIA.

By LIEUT.-COL. D. McCAY, M.D., M.R.C.P. (Lond.), I.M.S.,

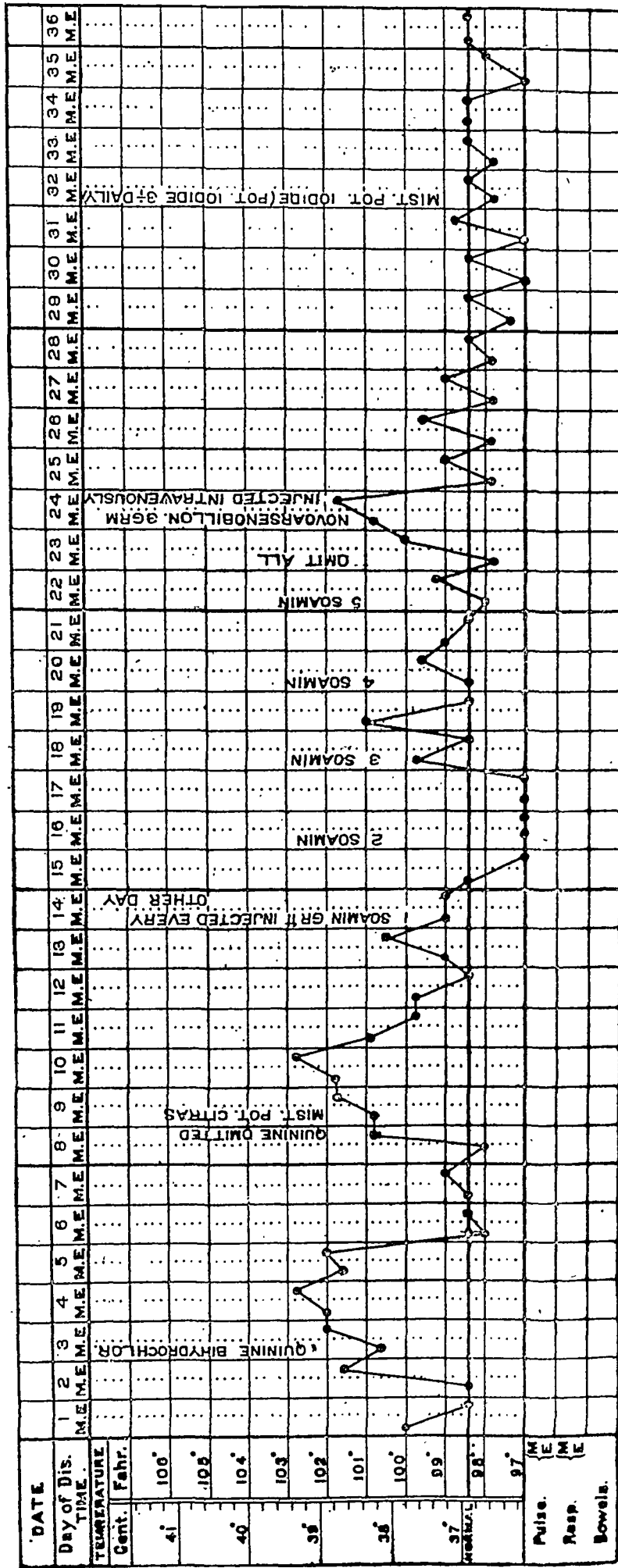
Officiating Professor of Materia Medica and Clinical Medicine, Medical College, Calcutta.



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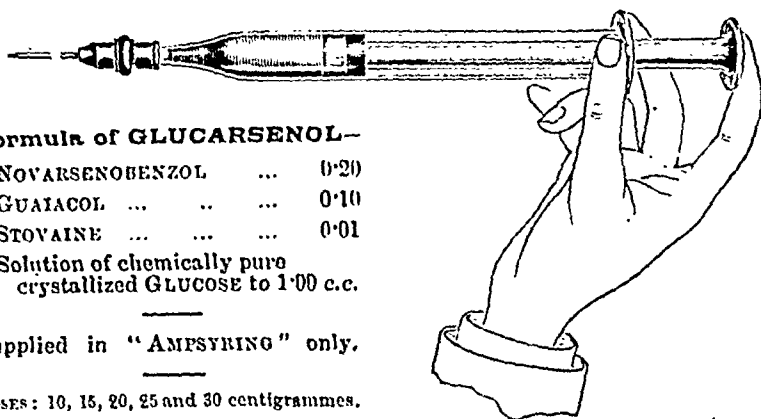
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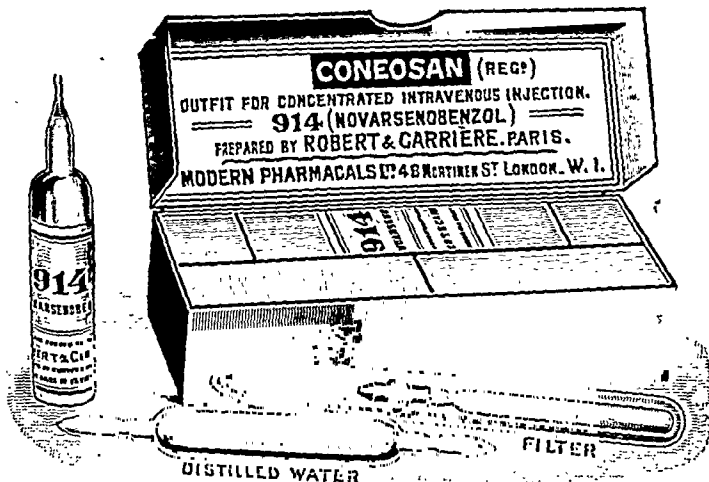
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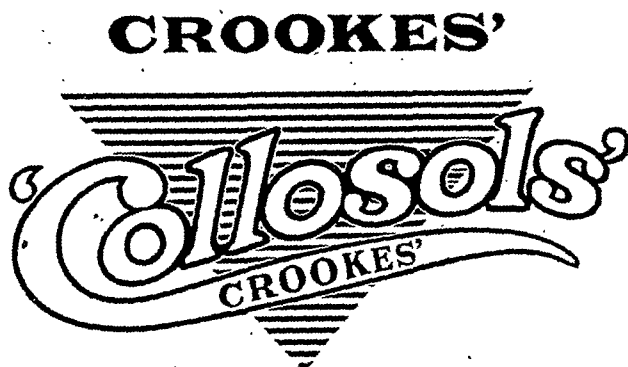
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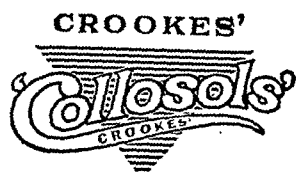
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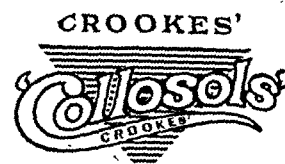
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Indian Medical Gazette

JULY.

KIDNEY DISEASE AND KIDNEY FUNCTION.

FROM the time of Bright the whole subject of kidney disease has been visualized by the physician from the standpoint of morbid anatomy and histological pathology. Every case of kidney trouble has been classified from an etiological and anatomical basis as some variation of glomerulo-nephritis.

Clinically, the ordinary cases of chronic nephritis—particularly those of the large, white variety—were looked upon as of very serious import and the prognosis was generally very grave. The cardio-renal type of the disease was considered only slightly less grave.

In the days when the presence of albumen and casts were the basic signs of renal disease the diagnosis of nephritis was a simple matter; yet, to-day the certainty of such a diagnosis on such premises is by no means accepted. By different methods of examination of kidney function combined with the chemical analyses of the blood, very considerable advances have been made in recent years with regard to the determination of the true state of the kidney, and as to whether nephritis is really present or not.

The pathological concept, which taught us the various forms which kidney disease may assume, is now no longer adequate as a criterion for renal diagnosis, owing to its frequent failure to correspond with clinical manifestations and urinary signs. Similarly, the experimental forms of nephritis produced in animals—although they have demonstrated the intimate relationship between the pathological changes and the functional activity of the kidneys—cannot be applied directly to the clinical diagnosis of nephritis, for the reason that the conditions under which nephritis is produced experimentally and those under which it arises clinically, are not comparable.

Amongst the newer methods of diagnosis the place occupied by renal function tests is assuming greater importance daily, yet the information yielded by such tests is often inconsistent and misleading, for the reason that the position of

the kidney in the animal economy is such that alterations in renal function may arise from causes outside the kidney.

We are indebted very largely to America for a great deal of the recent research work on kidney disease, and particularly to Epstein, who has devoted himself largely to this line of research. In a recent paper on the *Diagnosis of Nephritis*, Epstein lays stress on the fact that our view of nephritis must be comprehensive and that we cannot rely on any single method of investigation for the proper understanding of abnormal kidney conditions.

In the present state of our knowledge the diagnosis of nephritis is confronted with two distinct problems: first, the determination of the pathological processes involved, and secondly the evaluation of kidney function. The acute forms of the disease, acute glomerulo-nephritis, acute non-suppurative interstitial nephritis and acute tubular nephritis or nephrosis—these often constitute the forerunners of contracted kidney or large, white kidney—are essentially different from the chronic forms of nephritis. In them we have to deal with acute changes and damage to a normally functioning organ, which, previously sound, is again more or less quickly restored to normal, provided it is not overwhelmed by the destructive agent. These types are usually due to bacteria or their toxins: their tendency is to recovery, provided the infective factors be no longer present and active, to work new damage to the kidney. Such conditions are exemplified in the kidney involvements seen in infective conditions, postpartum sepsis, suppurative sinus thrombosis, and even in the renal disorders which frequently occur in febrile diseases of all kinds: in these there is not that marked evidence of renal involvement that is usually to be found in true cases of nephritis, nor does the disturbance last much beyond the duration of the febrile attack. Even in scarlet fever the accompanying nephritis as a rule disappears.

On the other hand, in persistent and recurring infections the condition may go on to chronicity, and the evidence is strong that infected tonsils, sinuses, and pyorrhoea may account for many cases.

Chronic nephritis may arise from a great number of causes and present not only a great number of etiological factors, but also a great

variety of symptom combinations. Certain clinical types, however, occur with such regularity that definite rules may be established for their recognition.

Thus Widal groups chronic nephritis into two general classes:—(1) the azotemic, to which belong the chronic interstitial forms, primary and secondary, in which retention of nitrogenous waste products in the blood occurs, leading to and terminating in uræmia; (2)—the parenchymatous forms, which are characterized by the retention of water and salts and the development of œdema. These forms, however, are rarely pure, so that the clinician finds himself embarrassed in appraising the relative value of the heart, the blood vessels and the kidneys as factors in the production of some of the symptoms.

Albuminuria, with or without casts, is still the cardinal point round which all questions of renal diagnosis revolve. Given a case with albumen in the urine, the question arises is it a nephritis—a definite renal lesion or some other disorder?

To the answer of this question the present day methods of functional tests are becoming more and more essential as the knowledge of their importance becomes disseminated.

The functional methods of renal diagnosis, generally speaking, are divisible into two groups:

(1) Those that aim at determining the character and extent of the renal disease by estimating the response of the kidney to physiological and other specially selected stimuli;

(2) Those that aim at determining the nature and degree of the damage arising from the insufficiency of the kidneys.

To the first group belong those tests that depend on the excretion of substances administered in known quantities, which are recoverable more or less completely from the urine. Of these tests for estimating the general excretory capacity of the kidneys the best known is the phenol-sulpho-naphthalein. Although this and other tests of the same type—such as Schlayer's adoption of water and lactose as indicators of glomerular activity, and of sodium chloride and potassium iodide as a measure of tubular function; or the methylene blue test—may and do throw light on the condition of the excretory powers of the kidneys, the matter is not so simple as these tests would appear to indicate. It is a mistake to regard any one functional test as

being capable of measuring renal function as a whole, as each test at best, covers only a limited range of the kidney activities.

It is mainly for this reason that another group of functional tests, those that aim to determine the nature and degree of damage arising from disease of the kidneys, has come into being. The normal function of the kidney comprises the elimination, amongst other things, of the waste products of nitrogenous metabolism, and any failure on the part of the kidneys to functionate properly causes a retention of those substances in the body and their accumulation in the blood. It is therefore by the chemical analyses of the blood in kidney disease that real light can be thrown on the damage suffered by the kidney and that the presence or absence of true nephritis therefore can be determined.

The chemical analyses of the blood measure one or other of these nitrogenous substances. The total nitrogen, the non-protein nitrogen, the urea, uric acid, etc., also the phosphates, chlorides, alkalinity, etc.

The level of the non-protein nitrogen must be determined as the resultant of at least three factors—kidney efficiency, diet, and protein katabolism—and due credit must be given to each in appraising the functional activity of the kidney.

The normal percentage of non-protein nitrogen and of urea present in the blood may be taken to vary from '02 to '03; anything higher than the latter figure would therefore show a deficiency in the excretory functions of the kidneys.

Where œdema is present allowances must be made for the dilute condition of the blood, which is a common source of error. This can be obviated by determining the ratio between the total nitrogen and the non-protein nitrogen of the blood. A considerable amount of work has been done on kidney disease and kidney damage complicating diabetes by the members of the Indian Diabetic Enquiry—the record of which will appear in the July number of the *Indian Journal of Medical Research*. It is sufficient at present to state that the ratio should be at least as 100 : 1, whereas, where there are any clinical signs of renal trouble, the ratio falls rapidly and, in severe cases, reaches a proportion of 5 to 10 : 1. It was found that in practically all forms of kidney disorder, even when these were due to outside causes, such as failing heart

sepsis, etc., there was a distinct tendency to non-protein nitrogenous retention. In the interstitial variety urea, in particular, was often retained in the blood to an extent, twenty to thirty times the normal.

These findings throw a considerable amount of light on the cause of death in many diseases besides those frankly renal in character: thus diabetics, in India, may be taken in the very great percentage of cases to die from failure of kidney function, and not from diabetic coma. Coma, if a cause of death at all, is uræmic, not diabetic in nature.

It was practically invariably found that where albumen, even in small quantities, or albumen and casts were present, distinct signs of retention of nitrogenous waste-products were present in the blood. Many cases, even where the retention was considerable, could be greatly improved by dietetic and other forms of treatment, and the albuminuria often be made to disappear. This is a most important result, as the generally accepted opinion in such cases is that once the kidney is sufficiently damaged to show such marked signs of chronic disorder of function, the chance of recovery is meagre. We are glad to see, in connection with these findings, that Hunt, in discussing the etiology of nephritis (Annual Meeting of the Medical Society of the States of New York.), shows that once the etiological factors, acting as the cause of the kidney trouble, are removed a very great amelioration of the condition follows; in some cases the patients are probably completely cured. In the diabetic forms of albuminuria seemingly complete cure of the kidney disorder can be obtained, if the treatment is begun in time and is thoroughly carried out.

Yet these same cases of diabetic albuminuria if left to develop will inevitably go on to a condition of marked nitrogenous retention and end in uræmic coma, unless carried off by some intercurrent affection.

By means therefore of frequent analyses of the blood the clinician is in a position to appraise the margin of usefulness in the living functioning kidney, to study the effects of treatment in raising that margin, and to follow intelligently the course of the disease, and the effects of even mild infections in depressing the eliminating powers of the disordered kidney.

This is a very different position from that which has hitherto been held, where all our clinical impressions of the living patient were made to conform to the anatomical picture of the dead patient's kidneys. It is obvious that so far as the physician and patient are concerned, the chief interest lies in the question as to what the kidney can do, and not in the realization of how great the anatomical changes are which the organs may have undergone. It is now well recognized that moderately or even fairly advanced change of structure may impair the kidney function to only a small extent, whilst, with little visible change in structure, great functional disturbances may be present.

Another practical step of great importance in the treatment of certain forms of chronic nephritis has been made possible by the blood findings in kidney diseases. The usual teaching, founded on the general belief that nitrogenous waste products are always retained, was that the diet in all cases should be confined to one furnishing a low protein content.

As soon, however, as it was discovered that there were types of kidney diseases in which the blood showed no increase in nitrogenous waste product, but instead showed a very great depletion of the essential protein elements of the blood, the question at once arose whether a more liberal protein type of diet was not strongly indicated. Epstein was the first to advance this view and show that great improvement in the condition of those suffering from this type of nephritis followed on the change from a low to a high protein dietary.

Sir T. Clifford Allbutt, in a recent lecture on Renal Dropsy—published in the *British Medical Journal* of October, 1918—gives a most interesting and illuminating account of his success in treating a very severe case of chronic nephritis according to the newer ideas advanced by chemical physiologists. The underlying idea is that the poverty of the blood in proteins—and probably a particular type of protein, the globulins being in great excess—leads to malnutrition and low osmotic tension in the blood, so that water is retained in the tissues and thus dropsy ensues. By diet we hope to change this condition and increase the protein colloid content of the blood, thus determining a flow of water to the blood from the tissues, and at the same time increasing the nutritive value of the blood.

Thus the latest advances in biochemical research would appear to point to a complete change in the method of treatment of chronic parenchymatous nephritis.

It would seem highly probable that the poverty of the blood in proteins is due to the very large losses of albumen by the urine, which are characteristic of this particular disease. So great indeed may this loss become that the tissues may have a greater colloid content than the blood, thus upsetting the ordinary osmotic relationship. Whilst this holds good, it is absolutely futile to expect to be able to get rid of dropsy by diuretics, diaphoretics, etc.

Further, one characteristic finding of the blood in this type of case is lipæmia, largely the result of tissue breakdown. The abstraction of lipoids from tissue cells causes the inhibition of water with consequent swelling of the cells—cell œdema. Clifford Allbutt says that therefore the diet should be largely exclusive of fat—with this view we are inclined from our experience to disagree. Surely if by the administration of fatty food materials we can save the lipoids of tissue cells from being broken down, fat would be indicated in the diet. It is probable, however, that the lipæmia is a bye-product in the breakdown of the tissue cells, and that by feeding on a high protein diet, the tissue cells are spared, and thus the lipæmia obviated and cell œdema prevented.

Similarly carbohydrate food—the great sheet-anchor heretofore in the dietetic treatment of chronic parenchymatous nephritis—is under suspicion. One of the main products of carbohydrate metabolism is water, and therefore an excessively carbohydrate dietary may favour and promote the accumulation of water in the system and thus originate or increase the anasarca and dropsy.

The whole subject is of absorbing interest, and it is in the field of biochemistry and physical chemistry that we look to for the next great advances in the scientific treatment of many diseased conditions.

In connection with the treatment of chronic parenchymatous nephritis by a dietary of high protein value, we hope to publish in the next issue of the *Indian Medical Gazette* an account of an exceedingly interesting and instructive case.

Current Topics.

BLACKWATER FEVER.

ARTHWRIGHT and LEPPER (Trans. Soc. Trop. Med. and Hyg.) in reporting a series of sixteen cases occurring in the Eastern Mediterranean, arrive at the following conclusions:—

1. Blackwater fever is due to malaria.
2. It is predisposed to by a long-standing malaria infection with repeated relapses.
3. An attack of blackwater fever is precipitated by a relapse or recurrence of malaria.
4. The ascertained *maximum* and *minimum* intervals in different cases in our series between the arrival in a malaria country and the first attack of blackwater fever were *maximum* ten years, *minimum* seven months; between the first recognised attack of malaria and the first attack of blackwater fever were *maximum* ten years, *minimum* fifty days; between the arrival in a country which was non-malarial and free from *Anopheles* and the first attack of blackwater fever were *maximum* five months, *minimum* one month.
5. Quinine in the class of cases with which we have met has no share in producing blackwater fever, nor has quinine treatment during or after the attack any effect in prolonging or reproducing hæmoglobinuria.
6. The jaundice of blackwater fever is certainly in some cases due to bile-pigment in the circulation.
7. It is possible to estimate the total amount of blood-pigment in the urine, whether in solution or in the deposit, after converting it into acid hæmatin (modified Sahl's method). The amount of hæmoglobin lost by the kidneys is much greater than would be ascertained by an attempt at direct hæmoglobin estimation of the urine. We are convinced, however, that the kidneys excrete only part—possibly a small part—of the hæmoglobin which is lost in an attack of blackwater fever.
8. The treatment which appeared to be of most value was intravenous or rectal administration of physiological salt solution (NaCl 0.9 per cent.). Whether quinine is of value or not was difficult to decide, since all our cases had some quinine, and the intensity of the attack was no doubt different in each case."

Matko [Wien. Klin. Woch.] dealing with the interrelationship between quinine and urine in hæmolysis is led from his results to make the following suggestive remarks:—

The protective power of urine against a hæmolytic action of quinine depends upon its content of acid phosphates (K_2HPO_4) or Na_2HPO_4) which also exert *in vitro* a protective action. In order to prevent hæmolysis *in vitro* by 0.4 gm. of bisulphate of quinine, 0.007825 gm. of di-sodium phosphates, free from water of crystallisation, is necessary; the optimum amount is about 0.15 gm. As a result of these observations, the author surmised that the onset of blackwater fever is bound up with a disturbance of phosphate metabolism, and decided to treat a case of this disease with di-sodium phosphates. He injected intravenously a 24-year old man, 16 hours after the onset of blackwater, with 200 cc. of a 2.5 per cent. solution of di-sodium phosphate; seven hours later (6 P.M.) the urine was almost normal. One hour afterwards (7 P.M.), however, there was a severe relapse; at 10 P.M. 200 c.c. of the solution was again injected, and 8 hours later (6 A.M.) the urine was again

practically normal. Again at 7 A.M. a severe relapse occurred, and it was then decided to combine the di-sodium phosphate with sodium chloride, and at noon 120 cc. of a 6 per cent. solution (containing both salts in equal proportion) was injected. The result was astonishing, the hæmolysis ceasing immediately. The urine became clear one hour after the injection, and in 4 hours the hæmoglobinuria had completely disappeared.

The injection of di-sodium phosphate is followed constantly after about half an hour by a rigor and rise of temperature to from 39° C. to 40.5° C.; by combining the di-sodium phosphates with sodium chloride, the rigor and rise of temperature are avoided.

The general condition of the patient improved rapidly after the injections, which also had a remarkable effect on the blood. Before injection the red cell count was 3,000,000 and the hæmoglobin 40 per cent., and blood films showed profound changes in the red cells, e.g., marked poikilocytosis, etc. Two hours after the first injection the red cells numbered 5,000,000 and the percentage of hæmoglobin was 120: in blood films the red cells stained deeply and were all of normal appearance.

The author concludes that his observations on this case showed that on the one hand the injection of di-sodium phosphates resulted in the immediate disappearance of the severe blood changes, and the production of a normal red cell picture; and on the other hand that di-sodium phosphate in combination with sodium chloride brought the hæmolysis to a standstill.

QUININE IDIOSYNCRASY.

We have all met with patients who have been unable to take quinine, and with many more who say they cannot stand quinine: the following authenticated cases however illustrate the fact that idiosyncrasy to quinine does exist:—

i. The author injected into a small hæmorrhoid of a young lady 3 minims of a 10 per cent. solution of quinine and urea hydrochloride. There followed collapse with shortness of breath and swelling of feet and hands, so severe that the gloves had to be cut off, and an urticarial rash from head to feet. The symptoms subsided in two days. This was the third similar experience of this patient, the dose each time being very small.

ii. A lieutenant aged 36 who had never been in the tropics and had a good personal and family history, went to Mesopotamia, where he took quinine for an attack of fever. He promptly got bleeding from the nose and gums, red spots on the skin and nausea. The liminal dose was 0.4 gm.; 0.6 produced the symptoms mentioned. Later in hospital, when 0.6 gm. had been received in three doses, there appeared nausea, vomiting, great exhaustion and weakness of voice; he was somewhat dazed, heart sounds very weak, face very pale; later, petechiæ over the whole body, hæmorrhage from the nose and gums. He was eventually invalided home. It is assumed that the quinine had an injurious influence on the walls of the small blood vessels and the author suggests that hæmorrhage in and under the lining membranes of the internal organs, as the endocardium and pia mater, would explain the general symptoms.

iii. The observations here recorded were made in the course of administration of prophylactic quinine to a considerable number of troops; how many and where is not stated. The dose was 0.3 gm. daily and, at first, 0.9 gm. once a week. After two months the bigger dose was dropped out and no more untoward symptoms

were seen. The symptoms, observed in 0.2 per cent of the takers, were fever, a rash, and oedematous swellings. The rash took the form of urticaria, of scarlet fever, measles, erysipelas and in half the cases was attended with pruritus. In a few cases petechiæ were seen. The skin eruption left in some cases brown pigmentation. The oedema occurred chiefly on the face, about the pinnae and eyelids, and produced much disfigurement; the hands and feet also were affected. Fever was a feature in every case but one, a sudden rise reaching on an average 39° C.—(Extract *Tropical Diseases Bulletin*.)

THE ACTION OF FRUIT JUICES UPON THE TYPHOID BACILLUS.

REVIEWING Ko's article in the *Journal of the Formosa Medical Society* the *Tropical Diseases Bulletin* gives the following interesting conclusions:—

In the Orient where fruit is exposed for sale under most insanitary conditions after having been handled by any number of hands, probably none too clean, and often eaten raw on the street corner or just as purchased, a study like this is very timely.

Most fruit juices which are acid have a bactericidal action upon any typhoid bacilli that might gain entrance through the broken skin but naturally would not be able to overcome any outside contamination. Half-ripe fruit is usually more powerful in its sterilizing power than that which is fully ripe, the substitution of acid for sugar being the important change. Tannic acid is the strongest of the vegetable acids, followed by citric and tartaric and finally malic. Sugars and starches have no antiseptic action no matter how strong, rather encouraging than interfering with the vitality of the organism.

Solutions of acids for drinking purposes have considerable sterilizing power, the efficacy of these "lemonades" varying from that containing HCl, which is the strongest, through tartaric and sulphuric acid to citric acid, which is the weakest.

The list of those whose juices do not kill the typhoid bacillus includes—*Nephelium longanum* (longan fruit), *Citrus nobilis* (navel oranges), *Eryobotrya japonica* (biwa), *Mangifera indica* (mango), *Citrullus vulgaris* (water melon), *Eigen Carica*, *Pyrus sinensis* (pear), etc.

PASTEUR ON THE STAGE.

"A BOLD innovation," says our contemporary the *Paris Medical*, "was the idea to depict on the stage the life of a savant." But what fruitful lessons are to be learnt from the lives of some men whom the world has recognised as great. These tell of struggles and difficulties and of crowning triumphs, centralised in many cases around an ennobling type of human evolution. That is surely an object which lends itself attractively to dramatic treatment. At least the fact has appealed to a French playwright. There is now being performed in Paris a drama in five acts entitled "Pasteur." So full of glorious achievement was Pasteur's life that details for effective dramatisation admit of easy adaptation. The first act shows a class of students being instructed by a demonstrator. Then at a particular psychological moment—enters the Master. A war impression is imparted to the scene, for the time is 1870, when Pasteur, among his countrymen, was pre-occupied with the grave shadows which oppressed the French nation. As a consequence his laboratory had to be closed, and his work suspended during the war. In the second act fifty years is supposed to have elapsed. Pasteur is shown in the tribune of the Academy of Medicine

surrounded by a crowded assembly of hostile medical men. The scene depicts the violent criticism directed against his work to which, on occasions, he was subjected, emphasised by an old man at the age of eighty—Jules Guerin—challenging him to a duel. Nevertheless, the act ends happily, depicting Pasteur being presented by the President of the Academy with the Grand Cross of the Legion of Honour, "as the champion of truth and tenacity, not based upon obstinacy, but by conviction, revealing a character of incomparable majesty." The third act finds Pasteur tossed and torn by his conscience. He has discovered the anti-rabic vaccine. But his researches have only been confined to animals. He has not dared to test his vaccine upon man. Amid the distress of his mind, an old Alsatian comes upon the stage, bringing with him a son, aged ten years, who has been bitten by a mad dog. Here was the opportunity he wanted. But again his conscience disturbed him. Could he make the venture and inoculate the child? The inoculation was done. Much advantage, dramatically, is taken of the devoted attention displayed by Pasteur while following the effects of the inoculation, with the anxiety which befell him as to what the result would be, and the responsibility he had assumed in putting to the test in a human being a discovery fraught with such potential benefit to humanity. In the fourth act Pasteur is found in his country residence—ill, and wanting rest. His medical attendant discusses with him his case. But Pasteur is thinking of nothing else than of the boy and of the possible fate of his patient. Then amid his musings and misgivings the boy appears; Pasteur is satisfied that another triumph has been gained, and once more he is happy. The boy afterwards becomes an assistant in his laboratory. The last act represents Pasteur's jubilee at the Sorbonne, at which the President of the Republic, Carnot, embraces him in the name of France as the benefactor of humanity, and conducts him to the amphitheatre where are assembled the delegates of all nations. And so, by this play, as our contemporary observes, is being perpetuated the remembrance of a great Frenchman. The author of the play is M. Sacha Guilty.—(*The Medical Press*.)

LEPROSY.

The following extract from Sugai's paper on the Chemiotherapy of Leprosy and Tuberculosis is worth producing in connection with the papers by Rogers and Chatterjee dealing with modern methods of treatment of these diseases:—

The author records his results with potassium cuprocyanide in leprosy and tuberculosis. In 36 cases of leprosy after one to three injections of a 0.1 to 1 per cent. solution every 10 days, the nodes gradually become soft or begin to bleed, diminish in size or are resorbed, the leprosy ulcers heal, form scars and eventually lose their characteristic colour, sensory disturbances are overcome, and the growth of hair is stimulated in places where it has fallen out.

In this paper he also gives tables showing results in rabbits and the histological changes and the results of treatment in tuberculosis patients. He thus summarises his experiments—

"1. Potassium cuprocyanid when injected intravenously has an extremely beneficial effect in leprosy. It is probable that a cure might be effected if the treatment were continued for from six months to a year.

"2. A completely therapeutic effect in tuberculosis in animals has been demonstrated. The animals which received intravenous injections lived longer than those

which had no treatment. After 8 to 10 injections the animals were completely cured.

"3. Potassium cuprocyanid obviously had a favourable effect on tuberculosis in man, including the pulmonary form."

It is to be hoped that these experiments will be widely repeated and the results confirmed if possible.—(*Tropical Diseases Bulletin*.)

THERAPEUTIC NOTES.

We are indebted to the *Medical Press* for the following notes on Dr. Pillet's new book, which are of great importance and interest:—

Dr. Pillet, in a book published recently, has devoted a chapter to the principal errors which are to be avoided when treating a case of urinary disease. The book is more especially addressed to the general practitioner, and the latter will find the advice given in brief, terse language very useful. The following is an abstract of Dr. Pillet's main points:—

1.—*Examination of the Urine*.—Never omit to examine the urine "in a glass" as to degree of colouration, clearness, or turbidness. Many patients suffering from stone or tuberculosis are treated as cases of simple albuminuria, when in reality the albumen is due to pus.

Always test for albumen, sugar, phosphates, urates, and pus.

2.—*The Use of the Catheter*.—In passing the catheter never attempt to "command," but "obey" the urethra. The instrument should merely follow the latter. Forcible catheterism (however near the catheter may appear to be to the bladder) always means making a false track, which may lead to the death of the patient if the urine is infected.

Stop as soon as a drop of blood makes its appearance at the meatus, modify the position of the catheter, or, better still, use a smaller one. It is relatively easy for a specialist, with his wide range of instruments, to "pass in a difficult urethra," whereas if the practitioner creates a "fausse route," an incision may have to be made in the perineum or hypogastrium.

In the male the use of the metallic catheter ought to be completely dropped. Its handling is delicate even for the specialist. In the female, however, owing to its being sterilised so easily, it is very useful.

A rubber catheter does not remain aseptic, and deteriorates in quality when kept too long in an antiseptic solution. As a rule it can be boiled for a few minutes without risk of damage.

3.—*Gonorrhœa*.—Never attempt to pass a catheter in a gonorrhœal urethra, for that means infecting the posterior urethra and the deferent ducts, i.e., one or both testicles (orchitis, with subsequent sterility); the prostate (abscess); the bladder (cystitis).

Never advise lavages by means of a small syringe, for the patient invariably obliterates the meatus completely, injects the solution with too much force, and if the solution is rather strong (which is usually the case), the posterior urethra and the prostate become infected. Before allowing the patient to apply the injections himself, he should be carefully instructed by the medical man, who ought to supervise the operation at first. In case of any complication all urethral treatment should be suspended.

No gonorrhœa, acute or chronic, should be treated without repeated microscopic examinations. Do not prescribe balsamic preparations during the first stages of gonorrhœa; this is the way that attacks are prolonged.

Do not prescribe the use of medicated bougies to be introduced into the urethra; if they are old they are liable to melt imperfectly and penetrate into the

bladder, and it is not an easy matter to remove them with the lithotrite, as I have found in several cases.

Gonorrhœal orchitis never suppurates. Abscess of the prostate is nearly always due to a caustic injection used to abort gonorrhœa. The abscess should be incised through the perineum or rectum, and should not be allowed to open spontaneously in the urethra, for evacuation of the pus is incomplete and interminable. These patients always suffer from retention, and the urine should be evacuated by means of a soft rubber catheter. The state in these cases is a serious one, and requires urgent treatment, for a certain number of patients die from septicæmia.

In cases of "morning drop," do not advise marriage until the beer test and repeated microscopic examinations have been made. Do not believe that an attack of gonorrhœa lasts for years, and that it is simply a case of relapse; nearly always there has been reinfection.

4.—*Stricture*.—In case of acute retention hypogastric paracentesis is much preferable to prolonged and irregular urethral manœuvres.

In case of incontinence the bladder is not empty, but, on the contrary, distended. These cases (usually of long standing) may be cured by urethrotomy.

KING EDWARD VII MEMORIAL TUBERCULOSIS INSTITUTE.

The Hon'ble Surgeon-General G. G. Giffard made the following remarks at the annual meeting of the Edward VII Memorial Tuberculosis Institute, Madras:—

MR. CHAIRMAN AND GENTLEMEN,

I have several times inspected the Institute in its present quarters. Regarding the new site, I am glad to say that the Public Works Department are now satisfied that the foundations are correctly designed and the construction will soon be begun. Some hitch occurred over the building of the Muthiah Chetti Ward because the New General Hospital plans have been entirely redrawn and the place set aside for the building of the Muthiah Chetti Ward will not be available until the Government of India have passed the plans for the New General Hospital there. It must be disappointing that you have to wait, but it is unfortunately so.

I think some doubt seems still to exist as to the exact duties and functions of the Institute. The Institute is really only a part of the problem of dealing with the disease known now as tuberculosis. There is a change necessary in the public's idea of the disease. It was ordinarily known before as consumption. But although consumption is still and will be a large part of tuberculosis, because it is the most common and also the most popularly known, it is, however, very far from being the sole tuberculosis. Many persons suffering from lung disease come under treatment in the Tuberculosis Institute, but are not tuberculous. Many also who are suffering from tubercle in other parts of the body than lungs come under the treatment of the Institute. At present when one comes known as a consumptive, he is generally past treatment. Before patients reach such a stage in tuberculosis, they should find out in time the conditions of the disease and stop it. The Tuberculosis Institute is a sort of diagnostic out-patient room for tubercular disease. Many persons who go there suspecting that they may have the disease find they have not, and many who do not know they have the disease will be all the better for applying to Dr. Chandra Sekar and satisfying themselves that they have not the disease. In fact, it cannot be too widely known to the public that tuberculosis is

curable in its early stages. In the early stages it is difficult to diagnose, because an expert diagnosis is required to be quite certain that the diagnosis is correct, and although the ordinary medical man ought to have a very good knowledge of tuberculosis he cannot be expected to be an expert. The Tuberculosis Institute, therefore, is a place where cases in the earlier stages can be treated; but it requires as adjuncts to it two other kinds of wards—that is to say, the ward where the early cases can be treated, and the ward where the incurable cases can be treated.

Many persons are in doubt as to what the Institute intends to do. It is intended to be a place for early diagnosis and very early treatment, and also a place where students and doctors can learn the most up-to-date methods, and where the patients from Madras or Mofussil can come and receive expert opinion. It will do no harm to the city. Many have written to the papers and several have asked questions if the Tuberculosis Institute will not bring into Madras a large number of tuberculous patients, and, therefore, be a menace to the public health of the city. As a matter of fact, Madras already contains a large number of tubercular patients; there are more than 10,000 people who are suffering from the disease here, and even if the Tuberculosis Institute do bring in a few more cases, it will make entirely no difference. The other case in which Dr. Chandra Sekar's work in the Institute is criticised is that he uses tuberculin. It is undoubtedly a very dangerous drug in the hands of persons who are not thoroughly experts, but it is not in the least dangerous in the hands of persons who have made a very careful study of the subject.

It is the hope of those who have started the Institute that it will become the centre not only of treatment, but of training. With the spreading of knowledge amongst the laity much can be done, and they can safeguard themselves from being contaminated by tubercular patients. Dr. Chandra Sekar takes good care to safeguard the public around his patients as far as possible. It is also desirable that patients who go to the Tuberculosis Institute should be able to tell other patients how they are treated, and to advise them to seek advice in the same way. The Institute is thus an advisory as well as a medical and curative one.

I may say I have inspected the institute and think it is carried on with considerable difficulty; but the work was very well done, and it will become more popular when the good that is being done is widely known. I am sure Dr. Chandra Sekar may well be proud of what he has already done. I hope that practitioners, both male and female, and students, will soon become aware of the fact that very valuable clinical guidance can be obtained there—a knowledge better than can be earned in ordinary hospitals. With these words I have great pleasure in seconding the adoption of the report.

: GUAIACOL IODIDE.

Dr. John Maberly, in the *Medical Journal of South Africa*, puts forward an interesting suggestion for the exhibition of iodine in diseased conditions, in the form of guaiacol iodide. He writes as follows:—

The first question we naturally ask regarding any new compound is: Does it supply any real want in the pharmacopœia, or enable us to deal successfully with any pathological conditions which are at present outside the scope of any of our at present known pharmaceutical resources?

From the experience which I have gained during the last five years of the action of guaiaco-iodide,

I feel justified in contending that it fulfils both these conditions.

The pharmacopœia contains one organic form of iodine, namely, iodoform, which is very unsuitable for internal administration. Of inorganic salts we possess several, namely, the iodides of potash, soda, mercury, arsenic and iron. Of these, the one we most commonly employ with the object of obtaining the therapeutic action of iodine is potassium iodide.

The atomic weights of its two elements are: Potassium 39, and iodine 127. This means that in administering, say, four grains of potassium iodide, we are apparently giving our patient rather more than three grains of iodine, or, in the ordinary rate of dosage of about 15 grains of potassium iodide per diem, we are presumably administering 11·47 grains of iodine, or the equivalent of nearly one ounce of tincture of iodine, the latter containing $12\frac{1}{2}$ grains of free iodine to the ounce. When we look at the question from this standpoint, we realise how very inert iodine in the form of potassium iodide must be. If it were not so, it would be impossible to administer such enormous doses of iodine and continue it over long periods without producing very undesirable results.

In the form of arsenic and mercury iodides we certainly have more active drugs, but in those forms the association of arsenic or mercury with the iodine complicates the question and still leaves us without any simple and effective drug for the administration of iodine *per se*. The tincture is also objectionable on account of its irritant effect on the gastric mucous membrane, and clinically does not appear an effective way of giving the drug.

It appears to me that what we really want is an organic form of iodine which shall be readily absorbed and broken up in the system and shall exhibit the therapeutic effects of iodine in a more marked manner than any of our present compounds. This I believe we have in the compound I am now bringing to your notice.

The following is the method of constructing guaiacol-iodine which I have been making use of for some years:—

Guaiacol, pur.	...	...	Minim	1
Solution Iodine ($12\frac{1}{2}$ grains in one ounce of Sp. Vin. Rect.)	...	...	Minim	1
Spirit. Vin. Rect.	...	...	Minims	20
Aq. Dest. ad.	...	...	Drachm	1

If the drugs are added in the above order, a slight rise of temperature takes place on the addition of the distilled water and a change gradually takes place in the mixture. The free iodine disappears and a stable compound is formed in which iodine is combined with guaiacol as a substitution product—a portion of the iodine replacing hydrogen in the guaiacol. Whether the whole of the iodine goes into this form or not is a question on which skilled chemical work might throw some light.

In the following records I have taken the above formula as the basis of my statements as to dosage, one drachm of guaiacol iodide representing '026 grain of iodine or roughly $1/50$ th* grain of iodine.

Guaiacol ($C_7H_8O_2$) is a colourless liquid, stated by Whittla to be the active constituent of creosote. Apparently it is a Continental product, as during the war the price has steadily risen to a very high figure.

In administering the drug, I always add an equal quantity at least of simple syrup and two drachms or more of pure or boiled water. The adult dose is one drachm given every eight hours in acute conditions for the first two to four days, afterwards reduced to twice a day. Children half a drachm.

The dose of iodine in the above is extremely small and yet the clinical results are very striking. I have twice produced an iodide rash in children under one year with the above given twice a day for 14 days. When we consider, however, the probably very small quantity of iodine normally present in the blood this fact need not surprise us.

So far as we know at present the chief supply of iodine to the system is through the secretion of the thyroid gland; the quantity present at any time is very small, and yet any increase or diminution in that amount gives rise to a set of symptoms which are a very marked deviation from the standard of normal health. It appears, therefore, quite feasible that such a minute dose of iodine as $1/50$ th grain, provided it is in a form to be readily absorbed and utilised in the organism, should be quite sufficient to have a marked effect in pathological conditions.

Some years ago the very unsatisfactory results which could be attained by any known therapeutic agent in tubercular affections very much impressed me. I found guaiacol of some use in early stages, but the results were very uncertain.

One day the idea occurred to me that if I could in some way combine guaiacol with one or other of the haloids, I might get more definite results. One of the fruits of that idea was the discovery of the method of constructing the guaiacol iodide. Clinical results, however, gradually forced upon me a very different opinion of the action of the drug from that which I originally set out to obtain. It soon became clear that the drug had very little effect in tubercular lung affections, but its use in place of potassium iodide in that class of case in which I had been accustomed to use the latter drug soon convinced me that it was a much more efficient agent. The absorbent action of the drug in chronic enlargement of the glands, in the treatment of the set of conditions we name "strumous," and which we now consider due to inactivity of the thyroids in chronic metritis, etc., was much more marked and rapid than that obtained by administration of potassium iodide; and when given in the form indicated with syrup and water has never given rise to any gastric irritation. The results obtained in the treatment of diseases associated with the cerebro-spinal fluid and membranes and the pleura promise, however, to place this preparation on a footing quite distinct from that of any known medicinal form of iodine.

In private practice it is rather a difficult matter to keep accurate records of experimental work. Most of the nursing is of a lay type, and the medical man perhaps only sees his patient once a day, or less frequently. Much of one's work with new drugs is at first tentative, and nothing but the impression of the result obtained is left as a mental guide for future use; but not in the form of an accurate scientific record, so that one has to ask a certain amount of indulgence in this respect.

Naturally one of the earlier methods of testing the value of the drug was in syphilitic affections. I tried it in various stages of this disease, sometimes in combination with inunctions of mercury, and found the results very similar to those obtained by the older methods of iodide of potash and hydrarg. perchlor.

Whilst stationed at No. 4 General Hospital, Robert's Heights, I had an opportunity of estimating the value of the drug and comparing it with other lines of treatment, and came to the conclusion that it was not of special value in syphilis, except that it was more rapid in its action. It was necessary to give salvarsan or similar compounds to complete the cure of acquired syphilis and obtain a negative Wassermann reaction.

In chronic glandular enlargements the drug appears much superior to any other form of iodide. I have

* $1/39$ th would, of course, be a nearer approximation.—Ed.

used it in quite a number of cases, and have found its absorbent action in these conditions much more rapid and efficient than that of any other method of administering iodine internally. Half to one drachm doses given twice a day for a few days, and then reduce to once a day, rapidly reduces the tenderness and enlargement of so-called tubercular glands, even when they are very much enlarged, provided they have not reached the stage of pus formation. In this case incision and the administration of guaiacol iodide will complete the process of resolution.

In the cases of children with a tendency to enlargement of the tonsils and adenoids, the administration of the drug has proved distinctly beneficial. No doubt many of these cases are really an expression of the lack of activity of the thyroid gland and consequent deficiency of thyroïdin in the blood, a modified form of the strumous diathesis.

I would now draw attention to some records in fields of therapeutics, where I believe guaiacol iodide will prove of especial value. Firstly, diseases associated with pathological changes in the cerebro-spinal membranes and fluid.

Dr. Maberly then proceeds to illustrate the good results obtained under different headings: meningitis, poliomyelitis, early tuberculosis of the bones, etc.

DYSENTERY.

Major J. Cunningham, I.M.S., and Captain H. H. Kink, I.M.S., from the results of an extended research on dysentery in the jails of Eastern Bengal arrived at the following interesting conclusions:—

(1) The great majority of cases of jail dysentery, when admitted to hospital, tend to get better of their immediate symptoms without any medicinal treatment. A restricted diet is sufficient to bring about this result and no better results can be produced by the more complete rest obtained by withholding all food while the acute symptoms are present.

(2) The disappearance of the actual dysenteric symptoms is hastened to a certain extent by the administration of a slight purge, such as a mixture containing soda and magnesium sulphate or grey powder.

(3) Salts appear to be superior to grey powder in the treatment of these cases, for the former causes the symptoms to disappear earlier and prevents immediate recurrences ('relapses in hospital') to a greater extent than the latter.

(4) None of the treatment tested appeared to have any influence upon the shortening of the convalescent stage of the disease (the length of stay in hospital).

(5) Treatment by a Shiga vaccine did not appear, as far as our cases went, to have any special advantage over other forms of treatment.

(6) The cases treated with emetin gave the same results as those treated with rest alone. Improvement following injections of this drug are, therefore, of no diagnostic value in the majority of cases of jail dysentery.—*Indian Journal of Medical Research.*

Major J. Cunningham, I.M.S., continued his researches on dysentery and in a recent number of the *Indian Journal of Medical Research* has published an interesting paper on Latent Dysentery. He concludes:—

(1) A latent form of dysentery exists, which may, when examined, show the presence of varying quantities

of mucus or mucus and blood in the stools, and ulcers in the rectum, and may also be secreting dysentery bacilli. Such cases may be compatible with apparent health and are therefore liable to pass undetected.

(2) The macroscopic examination of the stools for mucus or mucus and blood forms an easily applicable method of detecting these cases, and is much simpler and probably more effective than a bacteriological examination.

The method is not restricted to a population under restraint, but can be used in any community where stools can be regularly collected for examination.

(3) The estimation of the degree of existence of dysentery, as evidenced by repeated macroscopic stool examination, can be used, in the same way as the spleen rate is used in malaria, to form a "dysenteric index" of the prevalence of dysentery in a population.

(4) A series of ten successive examinations is sufficient to detect all the cases of latent dysentery present in a population.

With regard to the jails in which this inquiry was carried out—

(1) The occurrence of an acute attack of dysentery in an individual within a jail may be no other than a recrudescence of a condition which has been latent.

(2) The incidence of dysentery in jails may be accounted for in part—if not in greater part—by relapses occurring in prisoners who, when admitted, were suffering from dysentery in a latent form.

(3) The type of dysentery occurring inside the jails is merely the expression of the most prevalent form of dysentery in the outside population.

(4) All prisoners on admission to jail should be segregated and have their stools examined. Should they prove to be cases of latent dysentery, they should be further segregated in special gangs (post-dysenteric), until proved to be free from the disease.

Note.—The above conclusions have been based on observations made in a locality where the dysentery was endemic.

Heim (F.). Le salvarsan peut-il remplacer l'émétine dans le traitement de la dysenterie amibienne?

The author has tried the effect of salvarsan rectally and intravenously in a few cases of intractable amoebic dysentery with and without liver complications. The conclusions sufficiently represent the author's deductions from his cases.

"(1) Cases of amoebic dysentery occur in which salvarsan prove superior to emetine, in other cases emetine proves more efficacious.

"(2) The variable action of the two drugs depends on several little understood conditions, of which the chief appears to lie in the difference of the clinical forms of the disease: salvarsan is probably more effective in the purely intestinal form, it is certainly less active in the case where hepato-bronchial complications exist.

"(3) In using salvarsan the rectal method should first be tried, and the intravenous only in cases where the amoeba has extended beyond the large intestine.

"(4) Preferably one drug should be used at a time, combined therapy being reserved for very refractory cases.

"(5) Dysentery tends to relapse and to spread and should be treated as rigidly as typhoid or diphtheria. Every carrier of amoebæ should be closely observed and treated even when he presents no active sign of disease."—*Tropical Diseases Bulletin.*

BLACKWATER FEVER.

It is of interest to note that the Spanish observer, Lopez, from a study of the successful

treatment of blackwater fever, suggests the following solution to be given intravenously :—

Sodium chloride	...	...	20 grammes.
Calcium chloride	...	...	8
Sterile distilled water	...	...	1,000 c.c."

This is practically identical with that recommended, from experiments on the blood with hæmolysins, by Sutherland and McCay in the *Biochemical Journal*, Vol. V, 1911. The amount of calcium advocated by Lopez for intravenous injection is considerably higher than Sutherland and McCay found most effective in preventing hæmolysis. Their solution was—

Sodium chloride	...	...	12 grammes.
Calcium chloride	...	...	0.25 "
Sterile distilled water	...	...	1,000 c.c."

This solution has been employed most successfully in the treatment of several cases of blackwater fever in India.

CHOLERA.

THE following interesting method of treatment is given in the *Tropical Diseases Bulletin* :—

Kühne (Victor). Que faire en cas d'épidémie de choléra? (Une médication causale du syndrome diarrhéique.)—*Rev. Méd. Suisse Romande* 1918. Sept. Vol. 38, No. 9, pp. 555-569.

The author's experience, gained while in charge of a hospital at Nish after the peace of Bukarest (Balkan War), leads him to place the greatest reliance on Stumpff's bolus treatment to the exclusion of all others, including hypertonic saline injections, which he dismisses as merely symptomatic. He claims to have been able to reduce the mortality from 45 to 2 or 3 per cent. The method is to mix equal volumes of water and bolus alba (kaolin) putting the latter into the former (about 100 gm. of kaolin to $\frac{1}{4}$ litre of water) and allowing the patient to take a glassful cold every hour or half hour. It is rarely necessary to take more than 6 glasses (=about 200 gm. kaolin) in the first 12 hours. Generally the vomiting soon ceases, the pulse improves and the patient sleeps. During the second 12 hours and the following day one gives, according to the patient's condition, several glasses of the mixture, then for a few days a light diet. If the case is treated in this way from the beginning, cure results in 24 hours and the patient can leave the hospital in three days. Should the case be so bad that the stomach and intestines are atonic, the bolus mixture must be given by stomach pump, or if that is not possible as an enema. It is important that, during the 18 hours which follow the beginning of the treatment, except for water, neither food nor drink should be given.

All forms of gastric disturbance whether due to cholera nostras or metallic poisons, etc., are benefited by this treatment, which apparently relies upon the great absorbing power of the fine particles of aluminium silicate. An interesting history of the drug accompanies the paper.

LEPROSY.

DR. EMMANUEL ROBERTS in 1905 drew attention to the properties of a native drug—gugul—and

its value in the treatment of leprosy. He states that he has continued to use it with beneficial results. Dr. Roberts writes as follows :—

"Gugul is an oleo-gum-resin obtained from *Balsamodendron Mukul*, of the Natural Order Burseraceae, a native of Rajputana, Sind, Eastern Bengal and Assam. It occurs in irregular lumps formed of agglutinated tears of a reddish brown colour, and varying in size from that of a minute grain to a small lemon. It has a wholesome aromatic odour like that of cedar, and a bitter and aromatic taste not unlike that of myrrh. It consists of a gum, a resin, a volatile oil, and a bitter principle.

MODE OF ADMINISTRATION.

The crude drug is not suitable for internal administration. When purified it may be administered in doses of 5 to 20 or 30 grains.

The following preparations have been introduced :—

1. Extract Gugul [Liquid Co. (1 in 1), composed of Gugul, Adhatoda, Vasic, and Spirit of Chloroform: dose—One to 4 drams.

2. Tincture of Gugul (20%) with alcohol (90%). dose—Half to 2 drams.

The effects of gugul in leprosy are remarkable, so much so, that it may be looked upon as a specific. It stimulates the appetite, improves the general condition of the body, relieves the usual lassitude, gives a sense of well-being, relieves the nervous pains which are so very common, and produces a marked effect on the disease in a few weeks. The improvement is steady though slow, and all the three forms of the disease, tubercular, anæsthetic, and mixed, respond to the drug. Of the cases treated by me with gugul none has hitherto failed to respond to it, and improvement has been noticed even so early as two weeks after the treatment was begun.

From a consideration of the benefits derived in all the above-mentioned cases, I feel justified in looking upon gugul as a specific for leprosy, and in recommending its general adoption in the treatment of this loathsome disease."

THE QUESTION OF HOSPITAL EQUIPMENT.

THE Editor of the *Quarterly Journal of the Medical Missionary Association* writes as follows :—

In regard to the question raised in our last issue of the possibility of obtaining for medical missions hospital equipment which may become available on demobilisation, it is not possible as yet to give any definite pronouncement. A considerable amount of correspondence has taken place with the authorities chiefly concerned, and members may rest assured that the claims of medical missions will receive full consideration when any distribution of hospital stores may be in contemplation. Up to the present, however, there seems no reason to believe that there will be any auctioning of surplus stores since most of what is available will be made use of in permanent Government institutions.

The equipment of Indian military hospitals had been a frequent matter for unfavourable criticism long before the war, and now that the regimental system for Indian military hospitals is being given up and station hospitals established for Indian troops, there can be no doubt that very much of the war hospital equipment will be absorbed in bringing the permanent military hospitals thoroughly up to date.

A further question which is of interest in this connection is that of allowing medical missions to obtain supplies from the various Provincial Government Medical Stores. This has already been done to a very limited extent in certain Provinces, and the question of making the permission more general is at present under the consideration of Government.

It has for some time been a matter of discussion amongst certain members of the Association whether the conditions of membership of the Association are in all respects satisfactory. The present conditions, it will be remembered, are brief but fairly comprehensive:—"Graduates of recognised medical colleges of any nationality who are members of a permanent missionary organisation." It has from the first been assumed that the term "Graduate" is here used so as to include not merely the holders of University degrees but also of recognised diplomas. The introduction of medical registration in this country gives a legal qualification to all those whose Indian diplomas are regarded as qualifying them for registration; and the question arises whether the holding of such diplomas as those of Licensed Medical Practitioner or Sub-Assistant Surgeon or the mere fact of being registered by one of the Provincial Medical Councils can be regarded as a sufficient professional qualification for membership of the Association.

The reply to the important question above raised really depends upon a further question:—"What does the Association desire as regards its membership in general?" Up to the present, with exceptions so few as merely to prove the general rule, the members have all been themselves Medical Missionaries in the sense of having actual controlling charge of mission hospitals. This has not by any means excluded Indian medical workers from membership, since there are many such who have been placed in responsible charge of mission hospitals. Hitherto, however, the Association has not been regarded as intended for the members of the subordinate staffs of medical missions, house surgeons of hospitals, assistants in charge of district dispensaries, etc., and except in very few instances such Indian workers have not applied for membership.

It is for the members themselves to decide whether they wish the Association to remain restricted to those who are in the strict sense of the term medical missionaries, or whether to enlarge its scope so as to include all qualified (i.e., registered) medical workers in mission hospitals. The question is at present before the Executive Committee for preliminary consideration, but may probably need a reference to the whole Association for final decision, and the Secretary would be pleased to receive the views of any individual members on the subject which may assist the Executive Committee in the event of its being thought advisable to make proposals for an alteration in the rule.

Postscript.—I am glad to be able to add that since the above notes were sent to press, I have received an official letter of an entirely satisfactory nature on the subject of hospital equipment. I am not at liberty to quote the whole letter, but the following paragraph speaks for itself:

"As regards the medical missionaries being able to obtain some of the medical and surgical requisites which should become surplus to our requirements as demobilisation proceeds, the claims of the various mission hospitals throughout India to be considered when these are being disposed of will not be lost sight of.

I anticipate that we will have very large surpluses, for which we will certainly give medical missionaries preference over private firms if it comes to a question of selling Government stock in India."

We may therefore wait with confidence until the time of disposal of equipment stores, knowing that the

needs of medical missions will receive sympathetic recognition after the requirements of Government Institutions have been duly met.

RECENT WORK ON MALARIA.

LEYFARTH (*Berlin Klin. Woch.*; 1918), dealing with quinine-resistant malaria as seen by him during two years' experience in Bulgaria, suggests that the drug fails owing to faulty quinine preparations or to deficient absorption from vomiting, constipation, or diarrhoea, which again may be caused by the malarial parasites, the quinine itself, or an infection with true dysentery. (2) Other infective diseases are present as well as malaria. (3) There is an acquired quinine habituation either of the organism or of the parasites due to protracted treatment with insufficient doses, too long continued uninterrupted treatment, or to quinine prophylaxis. (4) Protective substances are diminished or absent in consequence of unfavourable conditions of the patient's life. (5) In some regions there is absolute quinine resistance of certain strains. (6) The parasites are quinine resistant in the capillaries of certain organs.

He points out that for success in treatment the causes of quinine resistance in any case must be ascertained. Diarrhoea caused by quinine seems to have been not uncommon; it is an indication for parenteral administration; stomach disorders were present in no less than 25 per cent. of cases. He lays stress on (4) as a common cause under war conditions, and points out that in the last six months of 1917, 124 deaths of inhabitants of the small town in which he worked were attributed to malaria and 63 deaths in hospital were assigned to subtertian malaria with certainty.

Experience has led him to realise the necessity of interruptions in quinine administration, and the imperfect absorption of quinine per os from various causes to give it at the outset by the intramuscular route. The course adopted was

- 8 quinine days, 1 gm. intramuscularly.
- 5 days' pause.
- 8 quinine days, 1 gm. per os in divided doses.
- 5 days' pause
- 2 quinine days. " " "
- 5 days' pause.

Thereafter 1 gm. on two successive days in each week for 6-8 weeks. This was successful with fairly recent cases not habituated to quinine. Old chronic malaria, reacting little or not at all to quinine, had to be "sensitised to quinine by neosalvarsan." In the case of quinine habitués, whether from treatment or prophylaxis, and when those in the latter class have been subject to frequent new infections, treatment is preceded by 1-4 weeks "dehabituation" or cessation of quinine, unless fever of a threatening character comes on; and in view of the fact that manifest malaria is more responsive to quinine than latent malaria, an attempt was first made to bring the parasites into the circulation by one or other of the known methods. A method successful in 50 per cent. of the cases was an injection of 0.25 gm. of optochin. The quinine treatment is given synchronously with the activation methods.

MORGENROTH (J.), *Die Therapie der Malaria durch Chinaalkaloide und ihre theoretischen Grundlagen*. [The Treatment of Malaria with Cinchona Alkaloids and its Theoretical Basis.]—*Deut. Med. Woch.*, 1918.

Professor Morgenthroth dissents from the commonly accepted view of Binz that quinine acts on the malaria parasite merely as a protoplasm poison. From the varying effects of different cinchona alkaloids on different micro-organisms, and even on the same micro-organism, he argues that quinine has a specific chemotherapeutic action. Experiments also by

several observers, whom he quotes, justify, he thinks, the influence that the degree of concentration obtained in the blood (namely, less than 1:20,000 a few minutes after intravenous injection, and 1:150,000 to 1:500,000 after introduction by the mouth) is far too low to act as a protoplasm poison.

He doubts that it is the small amount of quinine in the plasma that destroys the parasites, nor does he share the view that it is the quinine in the viscera; but from a series of careful and critically-devised experiments which are summarised below—he concludes that quinine is stored, or held, in the red blood cells, and that the prophylactic as well as the therapeutic effect of the drug is capable of explanation, as being due to the negative chemotaxy, or repulsion, exercised by the cinchonised red blood cells on the attacking parasites.

The technique of the first series of experiments cited rests on the fact that the cinchona alkaloids produce anæsthesia of the rabbits cornea when their solutions are brought in contact with the conjunctiva (MORGENROTH and GINSBERG, 1913).

To a 1:500 solution of optochin hydrochloride in 8.5 per cent. solution of cane sugar are added washed goat blood corpuscles so as to produce a 5 per cent. suspension. Centrifuge. Pour off the clear fluid (A) and shake the sediment in the small quantity of fluid which remains, so as to produce a thickish suspension of corpuscles (B). Now bathe one cornea of a rabbit for 3 minutes with A and the other cornea with B. A does not induce any definite anæsthesia, while after two minutes B makes the whole cornea completely anæsthetic, the full effect lasting for 20 minutes and then slowly disappearing.

In the case of the suspension of corpuscles the alkaloid concentrated thereon passes over to the cornea, a process which has been named by the author "transgression." The experiment may be made with quinine hydrochloride and the result is the same, but the anæsthetic effect is less; the author concludes that the results of all his optochin experiments hold good for quinine also. Experiments showed that human red corpuscles behave like those of the goat. It is concluded that the red corpuscles can store up quinine hydrochloride or optochin hydrochloride to a considerable extent, and give it up to other cells.

To see if these experiments hold good for concentrations such as occur in the blood *in vivo*, others were undertaken with defibrinated goat's blood, the biological test being employed.* When, under the same conditions, to (1) goat's serum and (2) goat's blood optochin was added so as to make a dilution of 1:100,000, the serum was promptly separated from (2), and the two serums further diluted to 1:200,000 and 1:400,000, it was found that the inhibitive effect on the growth of pneumococci was considerably greater in the case of the serum (1) than that of serum (2); the latter appeared to have lost about 50 per cent. of its optochin. To meet the objection that the deficiency could be explained by the drug being destroyed in the serum another series of experiments was made, depending on the fact that suspensions of the free bases of the cinchona alkaloids in salt solution exercise considerable hæmolytic action. If these suspensions are centrifuged it is found that the clear fluid does not contain enough alkaloid to produce hæmolysis. The inference is that the hæmolysis which takes place is attributable to the fixation of the alkaloid on the corpuscles.

From these three series of experiments it results that cinchona alkaloids are stored up in the red corpuscles

and that their holding in these depends on the holding in the surrounding serum and is constantly higher than this.

As regards the therapeutic and prophylactic action of the cinchona alkaloids in malaria, there are the following possibilities:—

(1) Ectocorpuscular sterilisation (a) by alkaloid dissolved in the blood plasma; (b) by transgression of the alkaloid stored in the blood corpuscles.

(2) Endocorpuscular sterilisation, by alkaloid stored in the red cells.

(3) Action by repulsion.

As regards (1) the possibility exists that free parasites in the immediate neighbourhood of the red corpuscles can take up larger quantities of the alkaloid than correspond to the holding of the plasma, the process being analogous to what happens in the rabbit cornea experiment. Endocorpuscular sterilisation (2) is by no means proved. In the consideration of (3) we come to the most interesting part of the paper. It is agreed that the merozoites have a very short period in which to enter the red corpuscles, failing which they become disintegrated in the plasma. It is a legitimate assumption that quinine, which Binz showed had a negative chemotactic action on leucocytes, has a corresponding action on the amoeboid merozoites or sporozoites and, given the difference in the concentration between the red cells and the plasma, the parasite will be unable to penetrate into the red cell. It is barred out, and then destroyed or starved. This hypothesis, the author thinks, completely explains quinine prophylaxis, and is sufficient to explain quinine therapy. At any rate the repulsion theory and the fact that the red corpuscles store up quinine must henceforward be taken into consideration. The former gives the new point of view, that organotropy and parasitotropy are not opposed, but rather that, as far as the red cells are concerned, a heightened organotrophy is, *cæteris paribus*, to be looked upon as therapeutically favourable. Cinchona alkaloids with a maximum affinity to the red cells, and a repulsion faculty greater than that of quinine would, if they could be obtained, be of great value in prophylaxis and the treatment of recent cases, and the author has little doubt that such can be found.

MEDICO-LEGAL NOTES OF INTEREST IN THE CHEMICAL EXAMINER'S REPORT OF BENGAL.

SENIOR Assistant Surgeon Hemnath Adhikari, B.A., M.B., who is responsible for the Medico-Legal Department, contributes the following notes on selected cases:—

HUMAN POISONING.

1. *Aconite as an arrow poison.*—The viscera of a Sepoy, 2nd Lakhimpur Battalion, Assam Military Police, were forwarded for analysis by the Commandant, 2nd Assam Rifles, Sadia (Lakhimpur), with the following history:—The dead body of the Sepoy was found with two arrows sticking at the back, at Nizamghat outpost, a place inhabited by aboriginal hill tribes. On *post-mortem* examination, one metallic arrow was found lying into the spleen substance, penetrating from the posterior border and pointing on its anterior border. One bamboo arrow was found between the liver and right kidney and one metallic arrow was found into the scalp at the site of the external head injury. The Medical Officer gave his opinion that death was due to hæmorrhage from puncture of spleen by penetration of arrow. But the Commandant wanted to know whether the arrows used were poisoned. The viscera with the arrows were submitted to chemical analysis and aconite was detected in them.

* The biological test depends on the fact that serum containing optochin in minute quantity (1:400,000–1:800,000) will prevent the growth of pneumococci in an otherwise suitable medium to which it is added. [See ALMROTH WRIGHT, *Lancet*, 1912, Dec.]

2. *Aconite in haria (country liquor).*—The Sub-Assistant Surgeon of Simdega, Ranchi, sent the viscera of one Prabhu Sahai alias Ghasi Uraon, who took his evening meal consisting of rice and *dāl* with a little *haria* (liquor prepared locally from rice). Three or 4 hours after, he complained of burning sensation in his stomach and throat and died on the following morning. Aconite was detected in the viscera.

A quantity of *haria* alleged to have been taken by the deceased was subsequently sent for analysis and aconite and alcohol were detected.

3. *Aconite and arsenic in pachai (fermented rice).*—The Sub-Assistant Surgeon, Rampurhat, Birbhum, sent the viscera of two persons, aged 28 and 33, respectively, with the history that both of them drank *pachai* liquor in the evening and came home, where they partook the same meal (consisting of rice, *dāl* and vegetables). Soon after both of them felt uneasy, became restless, vomited, purged, complained of very severe pain and died a few hours after. *Post-mortem* examination showed marked congestion of stomach, etc. Aconite, arsenic and alcohol were detected in the viscera of both the deceased.

4. *Antimony poisoning.*—The Commissioner of Police, Calcutta, forwarded some cocoa for analysis. The history of the case was that soon after taking the cocoa, all the members (adult and children) of a European family commenced vomiting and purging. The illness lasted for about 4 hours, after which all of them recovered. Antimony was detected in the cocoa. Antimony poisoning is so rare that this case would form an interesting record.

5. *Arsenic in a hanging case.*—The Assistant Surgeon, Tezpur (Assam), forwarded the viscera of one Mangal Napit with the history that his body was found with an oblique mark round the neck. *Post-mortem* examination revealed a continuous oblique mark of ligature round the neck, about $1\frac{1}{2}$ inch broad, white in appearance, placed between the chin and cricoid cartilage in front and the centre of the nape of the neck behind. On dissection, the subcutaneous cellular tissues were found condensed in several places, having a hard feel, lungs, larynx and trachea congested, right side of heart full and all the signs of asphyxia were present. The mucous membrane of stomach was congested in some places and the stomach contained undigested food. The Assistant Surgeon was of opinion that death was due to asphyxia, probably as a result of suicidal hanging, and the Civil Surgeon also concurred with his opinion. Arsenic was, however, detected in the viscera.

6. *Arsenic in a cremated body.*—The Civil Surgeon of Monghyr forwarded the ashes and remains of the dead body of one Musammatt Monothlia, who was said to have been poisoned by arsenic. The ashes, etc., were submitted to chemical analysis and arsenic was detected in them. Arsenic, being a volatile poison, is not found in the ashes of completely cremated bodies. In this case, partially cremated remains were sent for examination, with the result noted above.

7. *Copper sulphate poisoning (homicidal).*—The Sub-Assistant Surgeon, Goalpara, Assam, sent the viscera of one Guljar Mia and some clothing (sheet, *kantha*, rags, etc.) said to be soaked with the vomit of the deceased, for analysis. The history of the case was that Guljar Mia was ill and another man, who was said to be on intimate terms with his wife, gave him some powder as medicine, by taking which he began vomiting and died. Copper sulphate was detected in the stains of vomited matter on the clothes and copper salts in the viscera.

8. *Croton oil in well-poisoning.*—The Subdivisional Officer, Sadar, Rungpur, forwarded one rope with iron ring, some pasty substance wrapped in jack-fruit leaf, a piece of brick and a sack containing some earthy

substance with the history that all these articles were found in a well, the water of which tasted bitter and by drinking which a woman miscarried, several were attacked with diarrhoea and one actually died. Croton oil was detected in all the exhibits.

9. *Oleander poisoning (accidental).*—The Assistant Surgeon, Buxar (Shahabad), sent the viscera of a male child, aged 3 years. The history of the case is that the boy was found with a seed of Kaniar (Yellow Oleander) on 1st January 1918, at about 8 A. M. After that he vomited and was taken to Dumraon Hospital, where his stomach was washed out and he died subsequently. The washings of the stomach were also sent for chemical examination. Oleander was detected both in the viscera and the stomach wash.

10. *Strychnine poisoning due to wrong dispensing.*—The Subdivisional Magistrate of Alipore, 24 Parganas, forwarded the stomach washing and some powder alleged to be medicine for rheumatism prescribed by a doctor and purchased from a respectable druggist's shop. As soon as one dose of the medicine was administered to a female, she developed symptoms of poisoning. Immediately her stomach was washed and she recovered. The medicine prescribed consisted of aspirin, caffeine citras and phenacetin. Strychnine was detected in the stomach as well as in the powders in addition to the prescribed medicines.

11. *Datura poisoning (fatal).*—The Teacher of Medical Jurisprudence, Campbell Medical Hospital and School, Sealdah, forwarded the viscera of one Audh Bihari Kurmi, whose dead body was found inside the ashpit of down line at Naihati (E. B. Ry.). *Post-mortem* examination revealed the following: Lungs, liver, kidneys congested; right chambers of heart had fluid blood; meninges and brain somewhat congested; stomach contained some watery fluid with ash in it; the intestines were found congested and containing glairy mucoid, bloody, fluid, yellowish faeces. The Medical Officer, who held the *post-mortem* examination, was of opinion that death was due to asphyxia, some deliriant or narcotic (*datura*, alcohol, opium, etc.) might possibly have been the cause or a factor. Atropine was detected in the viscera of the deceased.

12. *Datura poisoning to facilitate theft.*—(a) The Commissioner of Police, Calcutta, sent the stomach washings of one Roghunandan Kurmbi, a cooly, who was given on 10th January, 1918, at 7 P. M., by one unknown person, some *pān* (prepared betel) in Juggernath Ghat, after eating which he became unconscious and was robbed of two gold ear-rings. He was subsequently found in Harrison Road and removed to the Campbell Hospital, Sealdah. Atropine was detected in the stomach wash.

(b) The same officer forwarded the stomach washings of Sini Warsaroo, who, on 16th January, 1918, after return from Ganga Sagar Mela was sitting at Juggernath Ghat, when a man named Rambrij Tewari offered him some *pooris* and vegetables to eat, which he did and half an hour after he became giddy, when Rambrij took out from Sini's person a purse containing five rupees. Sini caught hold of the man and made him over to the Police who removed Sini to the Mayo Hospital, where his stomach was washed out and he recovered. Atropine was detected in the stomach wash.

(c) The same officer sent a quantity of sweetmeat with the history that at about 9 P. M., on 27th February, 1918, an unknown Bengali visited a public woman at her house with a pint bottle containing country liquor and the food mentioned above. The woman took a quantity of the liquor and some sweetmeat. On the latter tasting bitter she threw it away on the floor. After a while she became restless and unconscious and on the following morning found that her ornaments

were missing from her person. Atropine was detected in the *pooris*, *kachuris*, etc.

ANIMAL POISONING.

1. *Aconite as animal poison*.—The Veterinary Assistant of Singbhum sent the viscera of a horse which was suspected to have been killed by poison. Aconite was detected in the viscera of the horse.

2. *Oleander as cattle poison*.—The Subdivisional Officer, Sewan (Saran) sent a piece of rag which was found in the dung of a bullock said to have been poisoned. The rag bore some blood marks and was covered with a reddish brown deposit. Oleander was detected in the exhibit.

THE following list of candidates passed the examination of London School of Tropical Medicine at the termination of the 59th Session (January–April, 1919):—

SOROUR, M. F.	} With distinction.
SMYLY, H. J.	
SEELLY, E. ST. J.	
LEEMBRUGGEN, H. U.	
KYLE, V. B.	
BOSTICK, J. B.	

SIR CLIFFORD ALLBUTT.

WE have much pleasure in publishing the following letter, which explains itself. Sir Clifford Allbutt deserves well of the members of the Indian Medical Service for the yeoman service he has rendered them in connection with the recent deputations to the Secretary of State for India of which he was the head. Full accounts of the proceedings of these deputations have already been published in the *Indian Medical Gazette* and it will be within the memory of all how splendidly Sir Clifford Allbutt put forward the views of the British Medical Association on the different questions at issue regarding the pay, pensions and prospects of the officers of the Indian Medical Service.

PORTRAIT OF SIR CLIFFORD ALLBUTT.

SIR—Sir Clifford Allbutt has accepted an invitation to allow the profession to present to him a portrait of himself painted by an eminent artist. The Council of the British Medical Association has taken the initiative in the matter because Sir Clifford Allbutt has been President of the Association during the years of the war, and will preside over its Annual Meeting in Cambridge next year. The esteem due to Sir Clifford Allbutt's attainments and the warm affection inspired by his character are such that very many, both within and without the Association, will desire to share in this tribute to one whose career has reflected so much honour on medicine in England. This desire will not be limited to his many pupils, first in Leeds and afterwards in Cambridge, nor to the grateful members of the Association over which he has presided during the past five years.

Subscriptions are invited from all members of the profession. The amount is limited to one guinea, and the Treasurer of the British Medical Association, 429, Strand, London, W.C.2, is now prepared to receive subscriptions of one guinea or less. Cheques and postal orders should be made payable to the "Sir Clifford Allbutt Presentation Fund," and crossed

London County, Westminster, and Parr's Bank.—We are, etc.,

J. A. MACDONALD,
Chairman of Council.
T. W. H. GARSTANG,
Chairman of Representative Meeting.
G. E. HASLIP,
Treasurer.

British Medical Association, 429, Strand, W. C.

THE SIR WALTER BUCHANAN FUND.

WE have pleasure in acknowledging the following subscriptions to the above fund:—

Col. C. R. M. Green, I.M.S.	... Rs. 200
Lt.-Col. R. E. Turner, I.M.S.	... Rs. 150
Lt.-Col. I. W. Cornwall, I.M.S.	... Rs. 100
Lt.-Col. F. P. Maynard, I.M.S. (Retd.)	... Rs. 100
Major H. H. Thornely, I.M.S.	... Rs. 100
Major C. E. Palmer, I.M.S.	... Rs. 50

The subscriptions already promised reach nearly one-third of the amount we desire to collect.

Reviews.

Essentials of Medical Electricity.—By ELKIN P. CUMBERBATCH, M.A., B.M., B.Ch. (Oxon.), M.R.C.P., in charge of the Electrical Department, St. Bartholomew's Hospital, etc. Fourth Edition. London: Henry Kimpton, 1919. pp. 368. 7s. 6d.

WHILE by no means pretending to be a complete exposition of the subject, this little volume comprises in its pages all the student and general practitioner need know about medical electricity. The style is lucid and the description of apparatus clear and abundantly illustrated by diagrams and photographs.

The present edition has been thoroughly revised and brought up to date. Many parts have been re-written, particularly the chapter on the electrical testing of muscles and nerves, which now includes an account of physiological and pathological principles underlying the subject. The use of condensers in testing, with the advantages and drawbacks of the method, is also fully dealt with.

The chapter on diathermy has been revised in the light of recent experience and forms fascinating reading to the student of medicine.

New instruments and some recent modifications of old ones, such as the Tripier Coil, the water rheostat, and the latest pattern of high frequency apparatus are described.

No pains appear to have been spared to bring the volume up to date and, if one may offer a criticism, it would be to suggest that the chapter on physical principles be placed at the beginning and not at the end of the book.

Elements of Surgical Diagnosis—By Sir ALFRED PEARCE GOULD, K.C.V.O., M.S. (Lond.), F.R.C.S. (Eng.), Fifth Edition with 16 Radiographic Plates: Cassell & Co., Ltd., 1919.

SINCE its first appearance in 1884 this most valuable little book has run through five editions and several reprints. This new edition has been brought thoroughly up to date by the exclusion of older methods of diagnosis that have been rendered obsolete by the extended uses of X-ray and of laboratory processes: new and improved methods, on the other hand, have been introduced and described clearly and concisely. The volume is primarily intended for students, but we have no compunction in stating that many men in actual practice will find within its pages great assistance in diagnosis. Just as the book came in we found many useful points within a few pages on the differential diagnosis of cancer of the breast.

We are very strongly of the opinion that this new edition will be as great a favourite with the medical profession—students and practitioners—as the previous edition, and we can thoroughly recommend it to the careful attention of both.

The plates are a distinct advantage and illustrate the conditions described in a most excellent manner.

Le Cholera.—Par H. VIOLETTE de l'Institut Pasteur. Préface de E. ROUX, Directeur de l'Institut Pasteur. Illustré de 100 figures. Paris: Masson et Cie, 1919. Prix 20 francs (+ 10% majoration temporaire).

THIS comprehensive treatise on cholera should be on the shelves of all who can read French, for it is written in the clear style characteristic of our Gallic allies.

What concern us most are the opinions of the author as to diagnosis and treatment. From his position in the Pasteur Institute he is well-qualified to speak of the bacteriology, and from his experience in Indo-China, China, Japan and Egypt he is competent to deal with the semeiology and the therapeutics of this disease, which may soon again become epidemic in Europe, and may, in the course of time, become so modified as to remain endemic in certain regions there.

The rapid methods of orientation employed by certain observers are entirely to be deprecated, he considers: for if their result be negative, further investigation must be done, and if it be positive, it requires confirmation. Thus they do not save time, as their users profess to believe. Whenever there is reason to suspect that a case of cholera has occurred, the bacteriologist should carry out a complete investigation, by cultivating the vibrios which he may find in the digestions in

peptone water, Dieudonné's medium (potassic blood-gelatine)* Violle's medium (sodic glycerine-gelatine), † etc., and testing the resulting culture with an anti-choleraic serum, for agglutination and also for complement fixation, against a standard strain of the vibrio.

The treatment of the case should be carried out by injections of hypertonic saline solution on the lines laid down by Rogers: for with an isotonic solution there is a marked tendency to renewed collapse after apparent amelioration of the symptoms has taken place. Where aneuria is present Rogers' alkaline solution should be used. With it Rosenthal obtained excellent results in the late Balkan war.

If anti-choleraic horse serum be available, it may be given in doses of 50 c.c. to 100 c.c., intravenously if possible.

As to the prophylaxis we are glad to see that compulsory vaccination of troops is recommended.

The author treats those who profess the cult of the conscientious-objector and the inviolability of the individual with fine scorn. It is very gratifying to find the work of Haffkine, Greig and Rogers praised so highly by so competent an authority.

Aids to Histology.—By A. GOODALL, M.D., F.R.C.P., (Edin.) Second Edition. Messrs. Baillière, Tindall and Cox, 1919. Price 3s.

THE first edition of this little volume was published in 1911. It is an attempt to present the essential facts of histology in a small compass and at the same time act as a guide to the junior student. That it has met a needed want is evident from the fact that a second edition has been found necessary. It gives the essential features in a compact and readily understood manner and saves the junior student from the bewilderment that would probably befall him if he relied exclusively on some of the larger text-books on histology.

It is by no means a simple cram book but gives clear accounts of the different structures in moderately technical language. Some parts, such as the central nervous system, are treated fairly fully and should provide the student with all that it is essential to remember.

The little book is well printed and the illustrations are all that could be desired.

* Dieudonné (modified): Equal parts of bullock's blood and normal (60%) solution of potash. Half an hour at 100°C in the autoclave. Mix with neutral nutritive gelatine of 3 per cent. strength, duly sterilised—7 parts to 3 parts of potash-blood. The strength of the gelatine is then 2 per cent.
† Violle: Neutral nutritive gelatine 2 per cent. strength, and containing 0.5 per cent. NaCl ... 100 g.
Glycerine ... 10
NaCl ... 1
Normal solution of soda (40%) in distilled water ... 2

Immune Sera.—A concise exposition of our present knowledge of Infection and Immunity. By CHARLES F. BOLDAUN, M.D., and JOHN KOOPMAN, B.S., Department of Health, City of New York. Fifth Edition, thoroughly revised. John Wiley and Sons, New York; Chapman and Hall, London, 1917. Price 7s.

THIS valuable little book has been very favourably received by the profession, and this has entailed the production of five editions since its first publication in 1904.

It is divided into twelve chapters and within these practically everything connected with immunity is dealt with. Thus there are separate chapters on infection and immunity, antitoxins, agglutinins, the Wassermann reaction, precipitins, cytotoxins, opsonins, snake venoms and their antisera, anaphylaxis, bacterial vaccines, leucocytic extracts in the treatment of infections, and Chapter XII deals with other reactions, the meiostagmin reaction, the Much-Holzmann cobra venom reaction, Weil's cobra venom test in syphilis, and antitrypsin determinations.

As a short concise exposition of the subject we can thoroughly recommend this book to both students and practitioners. It gives all the really essentials and is a most readable and interesting publication.

The publishers have done their part well and the paper and printing are all that could be desired.

Correspondence.

"THE EFFICACY OF QUININE IN MALARIA."

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—During the recent Science Congress in Bombay, the discussion on malaria showed that a certain proportion of medical men (and not a negligible one) had lost faith in the efficacy of quinine both as a prophylactic and as a curative agent. The discussion arose from an address on this subject by General Hehir, who, from statistics recently obtained by him, drew conclusions favouring the systematic use of the drug. Unfortunately time did not permit of his giving figures to confirm his views, or the remarks subsequently made might have been modified somewhat. Apparently the opinions of Sir Patrick Manson and other eminent authorities did not carry any weight with some of the speakers and it is therefore doubtful if the evidence of small fry will be regarded at all. I will nevertheless venture to give but one fact which came to my notice during the last malaria season (June to October) in this station and if it can be explained satisfactorily on any other ground but the efficacy of quinine, I am open to conviction. The fact is as follows:—

During the first five months of the year (non-malarial season), cases of malaria (almost entirely imported) occurred. A careful observation was kept on all these in the malaria season, during the whole period of which a daily prophylactic dose of quinine (gr. v) was being given, and at the end of the year it was found that not a single relapse had occurred amongst the cases. The conclusion from this may be, either that the infection was cured by previous treatment or that the daily dosage proved efficient in preventing a relapse. Either of these deductions, if granted, upsets the opinion that quinine is useless prophylactically or curatively. Personally I am of opinion that continuative treatment after the last attack had the curative action, but as the total incidence of malaria in the garrison was low, the prophylactic doses may have had some effect. Only one other condition, mentioned by one speaker, would have some bearing on the cure and that is as regards food. This undoubtedly is an important factor, but considering the fact that the rations and pay enable the sepoy

to feed himself well at all times and that he seldom does otherwise now-a-days, I think this can not be regarded as contributing markedly to cure; unless it be that the diet is regulated (often reduced at first), when its significance is changed from the nutritive point of view to one bearing on more effective digestion and elimination. This brings me to the question of treatment, which cannot be efficiently carried out unless we first ascertain the pathological effect of the disease and the full physiological action of the drug in question. In my opinion both the disease and the drug prevent the proper evacuation of bile by inspissating it, thereby producing a congestive condition reflecting on the portal system and efficient absorption from the alimentary tract. The drug may therefore be excreted and a wrong conclusion regarding its efficacy be formed thereby. That this opinion is not an isolated one will be seen from a reference to "Memorandum on some Medical Diseases in the Mediterranean War Area, 1917 (Reprint)," wherein, referring to the treatment of this disease, we find the following: "This spells quinine but the latter will often fail unless the liver is first of all put in good working order." This I believe to be the secret of success and one that has fully convinced me from years of experience that quinine, administered under favourable conditions, is an absolute specific for the disease.

General Hehir in a subsequent address to the Congress remarked that, although the treatment by this drug had been carried out for some years, the failure of the medical faculty to form any definite opinion on its utility, or futility, or to formulate any specific method of administration did not reflect creditably on them. To remove this stigma as far as lies in my power, and because of the importance of the subject, I have written the above and trust that you will find space for its insertion in your gazette.

Yours, etc.,
J. McDONALD.
Lieut.-Colonel, I. M. S.

ABBOTTABAD:
23rd April, 1919.

"YAWS IN INDIA."

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—With reference to the remarks in the May issue of the gazette that "indigenous yaws is unknown in India," the following may be of use:—

(1) Dr. A. Powell in his article on "An Epidemic of Yaws" in the *Indian Medical Gazette* of September, 1894, described cases met with in Assam and remarked: "That it was not described ere that in British India. It is said to have occurred in Pondicherry." He referred to the inter-communication between Madras and Ceylon, where the disease was common.

His enquiries last month show that the disease is still met with in Assam.

(2) Cases of yaws are being met with in the Vizagapatam District, Madras Presidency, and an enquiry in 1910 by Dr. T. S. S. Reddy, F.R.C.S., showed that the disease was yaws. It is prevalent in the Godavery agency according to the statement of a medical friend who was working there till six months ago. It may be remarked that the investigating officer met with some 94 cases in 80 villages of a population of 6,158.

(3) In a book printed at the Modern Printing Works, Madras, for private circulation—said to be Col. Niblock's Notes—the following occurs on page 92:—"Geographical distribution of yaws:— . . . Also met with in this country though rare. Occasionally found in Travancore and West coast. An epidemic occurred in Assam in 1891."

(4) In the report on the Sanitary Administration of Burma for the year 1915 it is stated as follows, on page 16: "Yaws:—This is referred to in the reports as being prevalent in the Lower Chindwin and Mergui districts, but no fresh information on the subject is supplied. It is also said to occur in the parts of Pakoko district bordering the Lower Chindwin district and in the village of Kundaw, Pakoko township. A few cases of yaws attended the Civil Hospital, Kyaukse, for treatment from neighbouring villages."

There are thus evidences to show that cases of yaws probably indigenous are being met with in this country. The subject is important enough and requires investigation, with a view to prevention.

Yours, etc.,
N. S. NARASIMHAN, L.R.C.P.S. (Bom.).

BOMBAY:
21st May, 1919.

CARBOLIC ACID GARGLES IN DIPHTHERIA.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—Mrs. C., on her way Home from Calcutta, consulted me on 9th March, 1919, for her right ear, having suffered from

pain and deafness for some two or three months. An examination revealed a growth of *aspergillus niger* in her right ear, about the size of a big pea, which was removed by syringing and peroxide of hydrogen. Simultaneous examination of the nose and throat showed an acute congestion of the fauces, tonsils and pharynx. On being questioned whether she had any soreness, she said none that she knew of. Next day she had fever 102°F . with swelling of the fauces and tonsils, the latter being covered over by membrane. Glands at the angles of both jaws were enlarged and tender. She said she was unwell since the morning, and attributed the condition of her throat, soreness and inability to swallow, to bad smell from some neighbouring drains next to her bed-room, where she had slept the night previous.

A provisional diagnosis of diphtheria was made and the patient was isolated, asked to remain in bed, take liquid nourishment, and gargle with 1 per cent. carbolic lotion. A smear taken and examined immediately did not show any B. diphtheria. Another swab sent to Parel Laboratory showed B. diphtheria, both on smear and culture. On receipt of this report, the next day, an injection of 8000 units of diphtheria antitoxin was made into the right flank, temperature 100°F ., the fauces clear of membrane which had come away, as the patient said, the previous evening by the vigorous use of the 1 per cent. carbolic lotion. Next day the temperature came down and the recovery was uneventful, and she was able to sail away on the eighth day, as she had already booked her passage. My object in describing this case is to point out the good and speedy effect of the carbolic lotion on the duration and course of the illness. The husband, who had been in contact from the third day, also used the lotion for gargles as well as a hand-wash.

Yours, etc.,

F. D. BANA, M.R.C.S., D.P.H., D.T.M. & H.

"IODINE IN CHOLERA."

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—Some years ago, I think probably from a letter in your journal, I noted the treatment of cholera by the methods described by one Dr. Bracho. He gave three methods of treating such cases and they were described as under. The last one was said to be most efficacious.

- (1) R
- | | | | |
|---------------------|-----|-----|-----|
| Tinct. iodi | ... | ... | m x |
| Acid sulphuric dil. | ... | ... | m x |
| Tinct. digitalis | ... | ... | m x |
| Aqua, ad. | ... | ... | 5 i |
- One ounce every four hours.
- (2) R
- | | | | |
|------------|-----|-----|-------|
| Iodum | ... | ... | gr. 4 |
| Ext. gent. | ... | ... | q.s. |
- Fiat pill one.
- One pill three or four times a day.
- (3) Intra-peritoneal injection :
- R
- | | | | |
|-----------------|-----|-----|-------|
| Iodum | ... | ... | gr. 4 |
| Pot. iodid. | ... | ... | gr. 4 |
| Aqua destillata | ... | ... | m.xx |

Twenty minims constitute one complete treatment for an adult. The injection is directed to be made in the region of the cæcum. Adrenaline is also given freely by mouth.

I mention these treatments as I happened to try the first method during the recent cholera epidemic and found it efficacious. I only added spt. camphor, mucilage and tinct. cinnamomi to the mixture, as the first drug allays spasms well and is also, I think, partly curative. I did not try the last method, as I was afraid to do so, thinking it would perhaps cause some peritoneal adhesions.

The usual treatment by pot. permanganas tablets and intravenous saline is quite good, but unfortunately the tablets—apart from their high cost—are sometimes not considered by some patients as sufficient treatment without a mixture, and less tablets with the iodine mixture is found equally good. The saline is objected to by many patients on account of the aversion to injections, and also the difficulty in having to treat single-handed several cases at various places.

The advantages, I think, in the iodine mixture method combined with the tablets are: (1) vomiting is early stopped, (2) there is a less tendency to retention of urine, (3) the drugs constituting the mixture are cheap. With this mode of treatment the tablets could be given every half hour instead of every fifteen minutes. The only disadvantage I found was that the patients complained of much burning in the stomach, due, I presume, to the large dose of iodine.

About the intra-peritoneal method, some of your readers may be able to advise on the matter. A less irritating preparation of iodine, viz. iodeol, is used in plague and is found efficacious. Perhaps this preparation or colloidal

iodine would be better for such injections, and would not I think, cause much peritoneal adhesions. To avoid any depressing action, pituitarin or adrenaline could also be given hypodermically.

BHIWANDI:
9th May, 1919.Yours, etc.,
J. F. HENRIQUES,
Asst.-Surgeon.

DIPHTHEROID INFECTION IN INFLUENZA.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—During the late epidemic of influenza some cases of interest came to my notice, of which I send you a short account. They were all cases of a "diphtheroid" infection (as found by me bacteriologically), producing somewhat different effects. I use the expression "diphtheroid," for although morphologically and culturally identical with the Klebs-Löffler bacillus, they produced on the boiled white of egg a yellow growth within twenty-four hours (this being the only difference).

1. A Gurkha patient was convalescent from influenza when he was supposed to have contracted "frost-bite." Dry gangrene of the right leg to the middle of the thigh developed as a consequence of thrombosis of the femoral artery. On the limb being amputated above the line of demarcation, I removed a portion of the thrombus and obtained from it a pure cultivation of the "diphtheroid"—apparently the cause, though a very rare one. In this case there were no general symptoms beyond a rapid, soft pulse and subnormal temperature.

2. A Gurkha patient developed catarrhal pneumonia in both lungs, the sputum showing a mixed infection. Consequent on this he got pleurisy on the left side. The effusion, at first slightly opalescent, became, as seen from later evacuation, cherry red and then purulent. From the last named a pure "diphtheroid" was cultivated. The patient recovered so far after the third evacuation as to be convalescent and able to move about. After eight weeks of convalescence he had a relapse, the effusion on this occasion being on the right side. This also showed the "diphtheroid." Treatment by "anti-diphtheritic serum" was recommended but not tried, and death occurred in forty-eight hours. Cultivation from the exudation from lung showed once more the presence of the "diphtheroid."

3. A Gurkha patient.—The sputum varied in character from the ordinary influenzal cases, in that, instead of being expectorated in large muco-purulent masses, the sputum was more homogeneous, of thinner consistence, and of a greyish white colour. Microscopic examination of this revealed the presence of large clumps of the diphtheroid and a pure cultivation was easily obtained. Treatment by "anti-diphtheritic serum" was recommended in this case too but was not adopted. The patient died within twenty-four hours of the discovery of these.

4. A British patient.—This case was identical with case No. 2 recorded above, with the following differences:—(a) After his relapse, fluid of a cherry red colour was evacuated three times in a fortnight owing to rapid refilling and respiratory trouble, and there was a rapid decline in health. At my suggestion "anti-diphtheritic serum" was then tried, with most excellent results. There was no further effusion, the patient himself, even after the first injection, expressed a feeling of relief, and after further injections his whole condition rapidly improved and he recovered as far as could be expected.

Remarks :

1. The presence of "diphtheroids" in pleuritic effusions I believe is rare.
2. The pneumococcus and pneumobacillus were present, but in almost negligible quantities.
3. It is not possible to say exactly what part, if any, this germ played in the production of the various clinical symptoms, but the results of anti-diphtheritic treatment in case 4 justify the conclusion that it was a potent factor in that case, at least, and probably in case No. 2.

Yours, etc.,
J. McDONALD,
Lieut.-Colonel, I.M.S.

ABBOTTABAD.

THERAPEUTIC NOTICE.

BURROUGHS, WELLCOME & CO.'S EXHIBIT.

at the Meeting of the British Medical Association, London, 1919.

THE keynote of Burroughs, Wellcome & Co.'s display is "Replacement of Enemy Monopolies by All-British Products." From the fact that nearly twenty years ago Burroughs Wellcome & Co. were manufacturing Pilocarpine and its salts, and at a little later date atropine, eserine,

nematropine and their salts, it is obvious that this firm did not wait for the stimulus of hostilities to commence their attack on German monopoly, and their pre-war production of the arylarsonate 'Soamin' made easier their notable achievement in the production of 'Kharsivan' and 'Neokharsivan,' which replaced German Salvarsan and Neosalvarsan at so early a date after the outbreak of war as to mitigate in a large degree the inconvenience caused by the cessation of supplies of these products.

Aspirin, salicylic acid, sodium salicylate, hexamine (replacing Urotropine), phenacetin, acetanilide, sodium glycerophosphate, benzamine salts (replacing B-eucaine salts), halazone, 'Tolamine' (Choloramine T), adrenalin, emetine, emetine bismuthous iodide, emetine hydrochloride, 'Epinine', 'Nizin' and 'Ernutin' (synthetic ergot), amongst other products exhibited, are examples of Burroughs, Wellcome & Co.'s activities directed to the acquisition and maintenance of British predominance in the fine chemical industry. The firm's avowed object is to excel, not merely to equal products of alien origin.

A variety of vaccines and sera are exhibited—products of the Wellcome Physiological Research Laboratories—a noteworthy feature amongst them being "Influenza Vaccine" and "Influenza Vaccine Mixed." The former is indicated in cases where the presence of the *Bacillus influenzae* has been demonstrated, and for the mixed vaccine it is claimed that some immunity is developed against organisms producing pulmonary complications.

'Laxamel' is not a new product of the firm, but one that has increased in favour as a means of administering 'Paroleine' in other than its original form. In the guise of a palatable, jelly-like confection containing about 81 per cent. 'Paroleine,' 'Laxamel,' is readily taken by those who cannot tolerate the liquid.

The 'Hypoloid' products—hermetically-sealed glass containers of sterilised solutions presenting 'Adrenalin,' 'Digitalin,' 'Epicaine,' 'Infundin,' 'Strophanthin,' etc., are most convenient for instant hypodermic medication.

Members of the profession who are personally interested in the question of analysis will find a variety of 'Solid' Brand Analysis Cases displayed—compact and portable outfits with all necessary apparatus and reagents for the examination of water, sewage, urine, etc. Blood test and bacteriological cases are also here. The 'Tabloid' Brand Medical Equipments range in shape and size from pocket cases to comprehensive outfits designed for the physician's carriage or motor. To be noted, too, are the 'Tabloid' Hypodermic and Ophthalmic Cases and products.

Messrs. Burroughs, Wellcome & Co.'s exhibit is a demonstration that despite war-time restrictions on development they have succeeded in enhancing their reputation for originality, accuracy and reliability.

Service Notes.

OBITUARY.

DEPUTY SURGEON-GENERAL SAMUEL JARDINE WYNDOWE, Madras Medical Service (retired), one of the few remaining Mutiny veterans died at Uley, Gloucestershire, on March 19th, aged 89. He was the son of the late Captain Wyndowe, born in 1830, was educated at St. George's Hospital, where he was dresser to Frank Buckland, and took the diploma of M.R.C.S. in 1854, and the degree of M.D., King's College, Aberdeen, in 1867. He entered the I.M.S. as Assistant Surgeon on March 24th, 1854, became Surgeon on March 24th, 1866, Surgeon-Major on July 1st, 1873, and Brigade-Surgeon, when that rank was first instituted on November 27th, 1879, retiring with an honorary step on June 15th, 1881. The year after he went to India he was appointed to a cavalry regiment of the Nagpur Irregular Force; in 1860 he was posted to Civil employment in the Central Provinces, and soon after was appointed Professor of Chemistry in the Madras Medical College, and Chemical Examiner to the Government of Madras. In August, 1867, he was given the Residency Surgeoncy of Haidarabad, and held that post till his retirement. He served in the Indian Mutiny from 1857 to 1859, took part in the engagement at Sambalpur, and received the Mutiny medal.

COLONEL ARTHUR OWEN EVANS, Indian Medical Service (retired), died at Lyndhurst, Hampshire, on February 22nd, aged 59. He was born on July 30th, 1859, educated at St. George's Hospital, and took the diplomas of M.R.C.S. in 1880 and L.R.C.P., Lond., in 1881. After acting as house-surgeon of Dewsbury Hospital, he entered the I.M.S. as surgeon on March 31st, 1883. After four years' military duty he was posted to civil employ in Burma, where he was for many years Civil Surgeon of Moulmein, and after his promotion to administrative rank, Inspector-General of Civil

Hospitals. He served in the Burma war in 1885-7, and received the medal.

TO BE BREVET MAJOR.

CAPTAIN R. F. D. MACGREGOR, M.C., M.B., Indian Medical Service; Captain J. Scott, D.S.O., M.B., Indian Medical Service.

INDIAN MEDICAL SERVICE.

SUBJECT to His Majesty's approval, Captain Claude Wells Woolton Baxter, M.C., has been permitted to resign the service with effect from the 20th April, 1919.

SUBJECT to His Majesty's approval, Lieutenant Dattatraya Mangesh Moolky is permitted to resign his temporary commission, with effect from the 11th April, 1919.

SUBJECT to His Majesty's approval, Lieutenant-Colonel Thomas William Stewart is permitted to retire from the service, with effect from the 1st May, 1919.

THE promotion to his present rank of Major (Brevet Lieutenant-Colonel) Robert Macpherson Barron, D.S.O., I.M.S., is antedated from the 29th January, 1914, to the 29th July, 1913, but without pay.

COLONEL HORMASJEE EDULJEE BANATVALA, C.S.I., K.H.S., was retained in the service from the 2nd to the 22nd April, 1919, and was during this period, borne as supernumerary in his rank and grade.

SUBJECT to His Majesty's approval, honorary temporary Lieutenant Maharaj Krishna Kapur to be honorary temporary Captain, with effect from the 5th February 1919.

EAST INDIAN RAILWAY VOLUNTEER RIFLES.

SURGEON-LIEUTENANT-COLONEL EDWIN HAROLD BROWN, M.D., M.R.C.P., resigns his commission. Dated 31st March, 1917.

MAJOR-GENERAL G. G. GIFFARD, C.S.I., Indian Medical Service, is appointed Honorary Surgeon to H. M., the King, vice Surgeon-General T. Grainger, C.B., M.B., I.M.S.

To be C. B. E. ... Lt.-Col. W. B. Lane, C.I.E., I.M.S.
" O. B. E. ... Capt. R. A. Chambers, M.B., I.M.S.
Capt. I. H. Nelson, M.C., M.D., F.R.C.S., I.M.S.

To be Brevet Col. ... Major and Bt. Lt.-Col. C. M. Goodbody, C.I.E., D.S.O., I.M.S.

" " Lt.-Col. Major T. S. F. Paterson, D.S.O., M.B., I.M.S.
Major E. A. Roberts, D.S.O., I.M.S.

To be C. I. E. .. Lt.-Col. P. F. Chapman, M.B., I.M.S.
" I D. Graham, I.M.S.
" W. H. Hamilton, D.S.O., F.R.C.S., I.M.S.
Lt.-Col. C. A. Sprawson, M.D., I.M.S.

INDIAN MEDICAL SERVICE.

SUBJECT to His Majesty's approval, Lieutenant-Colonel John Fisher, D.S.O., M.B., has been permitted by the Right Hon'ble the Secretary of State for India to retire from the service, with effect from the 25th March, 1919.

SUBJECT to His Majesty's approval, Colonel Hormasjee Eduljee Banatvala, C.S.I., K.H.S., is permitted to retire from the service, with effect from the 23rd April, 1919.

THE services of Majors J. E. Clements, I.M.S., Superintendent, Central Jail, Lucknow, and A. W. Overbeck-Wright, I.M.S., Superintendent, Lunatic Asylum, Agra, are placed at the disposal of the Government of India. Army Department, from the dates they relinquish charge of their duties.

THE undermentioned officers are granted, subject to His Majesty's approval, the acting rank of Lieutenant Colonel while commanding the Medical units mentioned against their names, from the dates specified:—

Major Francis Hugh Stewart, M.B., No. 13 Cavalry Brigade, Combined Field Ambulance, from 26th January, 1919.

Major Samuel Herbert Lee Abbott, M.B., No. 14 Cavalry Brigade, Combined Field Ambulance, from 27th May, 1918.

Captain Alexander Glover Coullie, M.B., F.R.C.S.F., No. 124 Indian Combined Field Ambulance (now No. 15 Cavalry Brigade, Combined Field Ambulance), from 15th April, 1918.

Captain James Burne Lapsley, M.B., M.C., No. 3 Combined Field Ambulance, from 4th November 1917 to 7th December, 1917.

LIEUTENANT-COLONEL J. G. P. MURRAY, I.M.S., made over charge of the Ranchi Jail to Lieutenant-Colonel J. C. S. Vaughan, I.M.S., in the forenoon of the 21st April, 1919.

CIVIL Assistant Surgeon Ali Ahmad made over the Medical charge of the Bhagalpur Central Jail to Major W. Gillitt, C.I.E., M.D., D.P.H., I.M.S., in the forenoon of the 6th May, 1919.

MR. F. B. ORRAH made over charge of the office of the Superintendent of the Bhagalpur Central Jail to Major W. Gillitt, C.I.E., M.D., D.P.H., I.M.S., in the forenoon of 6th May, 1919.

HIS Excellency the Governor in Council is pleased to appoint Lieutenant-Colonel G. McPherson, M.B., C.M. (Glas.), I.M.S., on return from military duty, to be Professor of Ophthalmic Medicine and Surgery, Grant Medical College, and Ophthalmic Surgeon, C. J. Hospital, Bombay, *vice* Dr. G. B. Prabhakar, L.R.C.P. (Lond.), L.F.P.S. (Glas.), L.M. & S.

HIS Excellency the Governor in Council is pleased to appoint Dr. R. D. Chinoy, M.B., to be Honorary Assistant Physician, J. J. Hospital, *vice* Dr. A. J. Noronha, M.D., for a period up to 30th April, 1920.

LIEUTENANT-COLONEL T. JACKSON, M.B., B.Ch., I.M.S., is granted, from the date of relief, such privilege leave of absence as may be due to him on that date in combination with furlough on medical certificate for such period as may bring the combined period of absence to six months.

MAJOR W. LAPSLEY, I.M.S., to hold charge of the office of Deputy Sanitary Commissioner, IV range, from the forenoon of the 20th March, 1919, to the forenoon of the 22nd March, 1919.

DR. D. D. PANDYA, Deputy Sanitary Commissioner, I range, to hold charge of the IV range, in addition to his own duties, from the forenoon of the 22nd March, 1919.

MAJOR C. L. DUNN, I.M.S. whose services have been replaced at the disposal of this Government by the Government of India, to Deputy Sanitary Commissioner, II range.

THE following appointment is made with effect from the date specified :—

MAJOR (BT.-LIEUTENANT-COLONEL) O. A. GILL, I.M.S., to be Chief Malaria Medical Officer, Punjab, with effect from 26th April 1919 (afternoon).

THE following transfer is made with effect from the date specified :—

Dr. A. E. MOORE, Civil Surgeon, Jhelum, transferred to Murree, with effect from 17th April, 1919 (forenoon).

INDIAN MEDICAL SERVICE.

THE following promotions are made, subject to His Majesty's approval :—

Temporary Lieutenants to be temporary Captains.

Richard Ronald Htoon Oo Tha, dated 13th March, 1917; Vasant Dinnath Madgavakar, M.B., dated 29th January, 1918; Khuda Baksh, Awan, M.B., dated 28th June, 1918; Durgadas Sanyal, M.B., dated 5th July, 1918; Mool Shing Bazaz, M.B., dated 9th July, 1918; Roshan Lal Khera, M.B., dated 11th July, 1918; Narayan Raghunath Shahane, M.B., dated 16th July, 1918; Ajit Kumar Sen, M.B., dated 31st July, 1918; Dwijendra Nath Bhaduri, dated 4th August, 1918; Harry Herbert Colwell, M.B., dated 11th February, 1919; Thakurdas Parmanand Vaswani, M.B., dated 15th February 1919; Vatackal Thomas Ninan, dated 16th February, 1919; Kunjuni Thirupod, dated 18th February, 1919; Govinda Sankaran Tampi, M.B., dated 22nd February, 1919; Gopal Gangadhar Limaye, M.B., dated 26th February, 1919.

MAJOR ARNOLD EGBERT GRISEWOOD, M.B., is granted, subject to His Majesty's approval, the acting rank of Lieutenant Colonel while holding command of an Indian Clearing Hospital, from 7th March, 1916 to 4th January, 1917.

THE following appointments, postings and transfers are made with effect from the date specified :—

Rai Sahib Gopal Das, 1st grade Assistant-Surgeon, in charge, Civil Hospital, Jhelum, Officiating Civil Surgeon, Jhelum, with effect from 9th April, 1919 (afternoon).

LIEUTENANT-COLONEL P. ST. C. MORE, I.M.S., Civil Surgeon, Sialkot, Civil Surgeon Dalhousie. With effect from 5th April, 1919 (afternoon).

THE services of Lieutenant-Colonel E. V. Hugo, C.M.G., M.D., F.R.C.S., I.M.S., are replaced at the disposal of the Government of the Punjab, with effect from the 13th March, 1919.

LIEUTENANT-COLONEL E. V. HUGO, C.M.G., M.D., F.R.C.S., I.M.S., is reappointed to be Professor of Surgery, King Edward Medical College, and 1st Surgeon to the Mayo Hospital, Lahore, with effect from the 13th March, 1919.

MAJOR R. H. BOTT, M.B., F.R.C.S., I.M.S., is reappointed to be Professor of Operative Surgery, King Edward Medical College, and 2nd Surgeon to the Mayo Hospital, Lahore, with effect from the 13th March, 1919.

MAJOR H. H. BROOME, M.B., F.R.C.S., I.M.S., is reappointed to be Professor of Anatomy, King Edward Medical College, Lahore, with effect from the 13th March 1919, *vice* Lieutenant-Colonel J. C. Lamont, C.I.E., I.M.S. (retired), permitted to resign.

SUBJECT to His Majesty's approval, the services of temporary Lieutenant Jamshedji Darasha Shroff are dispensed with on account of ill-health, with effect from the 7th April, 1919.

SUBJECT to His Majesty's approval, temporary Captain Villupuram Rajaratna Nastesan, I. M. S. is permitted to resign his commission, with effect from the 11th April, 1919.

THE services of Major W. G. Hamilton, I.M.S., are replaced at the disposal of the Government of Bengal, with effect from the date on which he is relieved of his Military duties.

THE services of Lieutenant-Colonel J. M. Woolley, M.D., I.M.S., are placed at the disposal of the Government of the United Provinces, with effect from the date on which he is relieved of his Military duties.

ON return from Military duty, Major H. Watts, M.B., B.S. (Lond.), M.R.C.S. (Eng.), L.R.C.P. (Lond.), I.M.S., is posted to Raipur as Civil Surgeon.

UNDER Section 6 of the Prisons Act, 1894, the Chief Commissioner is pleased to appoint Major H. Watts, M.B., B.S., M.R.C.S., L.R.C.P., I.M.S., Civil Surgeon, Raipur, to the medical charge of the Raipur Central Jail, in addition to his own duties.

ON relief by Major H. Watts, M.B., B.S., M.R.C.S., L.R.C.P., I.M.S., Senior Grade Assistant Surgeon, Rai Sahib Bipin Bhari Gupta, L.M. & S., Provisional substantive Civil Surgeon, Raipur, is transferred to Drug as Civil Surgeon.

LIEUTENANT-COLONEL R. G. TURNER, I.M.S., officiating Inspector-General of Prisons, United Provinces, on being relieved, reverted as Civil Surgeon, Fyzabad.

HIS Excellency the Governor in Council is pleased to make the following appointments, pending further orders :—

MAJOR C. C. MURISON, F.R.C.S.E., D.P.H. (Edin. and Glas.), D.T.M. (Liverpool), I.M.S., to be substantive *pro tem*. Civil Surgeon, Belgaum, with effect from the afternoon of the 19th March, 1919.

MAJOR L. P. STEPHEN, M.B., B.Ch. (Abern.), F.R.C.S.E., D.P.H. (Lond.), D.T.M. & H. (Cantab.), I.M.S., to act as Civil Surgeon, Karachi, and Civil Administrative Medical Officer, Sind, in addition to his Military duties, with effect from the afternoon of the 31st March, 1919.

HIS Excellency the Governor in Council is pleased to appoint Major A. F. Hamilton, M.B. (Lond.), F.R.C.S., I.M.S., to act as Physician in charge Bai Motlibai and Sir D. M. Petit Hospitals, and Professor of Midwifery, Grant Medical College, Bombay, *vice* Lieutenant-Colonel S. C. Evans, M.B., C.M. (Edin.), I.M.S., proceeding on leave pending further orders.

HIS Excellency the Governor in Council is pleased to appoint Lieutenant-Colonel R. M. Carter, C.B., F.R.C.S., D.T.M. (Liverpool), I.M.S., on return from Military duty, to be Professor of Pathology and Morbid Anatomy and Curator of Pathological Museum, Grant Medical College, Bombay.

LIEUTENANT-COLONEL E. F. G. TUCKER, M.B., I.M.S., First Physician, Sir J. J. Hospital, and Professor of Medicine, Grant Medical College, is granted privilege leave of absence for five months and eight days with effect from the 5th July 1919 or from the subsequent date of relief.

THE Governor in Council is pleased to appoint Colonel Hormasjee Eduljee Banatvala, C.S.I., I.M.S., to act as Inspector-General of Prisons, Bombay Presidency, *vice* Major W.O.S. Murphy, M.B., B.Ch. (R. U. I.), D. P. H. (Ire.), I.M.S., pending further orders.

THE Viceroy and Governor-General has been pleased to make the following appointment on His Excellency's Personal Staff, with effect from the 18th March, 1919:—

To be Honorary Surgeon.

Major A. E. J. Lister, M.B., F.R.C.S., I.M.S., *vice* Major E. A. C. Matthews, D.S.O., M.B., I.M.S., tenure expired.

CANTONMENT MAGISTRATE'S DEPARTMENT.

LIEUTENANT-COLONEL A. STREET, M.B., F.R.C.S., I.M.S., is granted, from the date of relief, such privilege leave of absence as may be due to him on that date in combination with furlough on medical certificate for such period as may bring the combined period of absence to six months.

MAJOR W. S. J. SHAW, M.D., I.M.S., is granted, from the date of relief, such privilege leave of absence as may be due to him on that date in combination with furlough on medical certificate for such period as may bring the combined period of absence to six months.

SUBJECT to His Majesty's approval, temporary Captain Charles Leonard Digby Roberts, Indian Medical Service, is permitted to resign his commission, with effect from the 1st May, 1919.

SUBJECT to His Majesty's approval, temporary Lieutenant Kaikhusroo Rustomji Dalal, Indian Medical Service, is permitted to resign his commission, with effect from the 31st March, 1919.

SUBJECT to His Majesty's approval, temporary Lieutenant Eladeth Kunjunni Menon, Indian Medical Service, is permitted to resign his commission, with effect from the 2nd May, 1919.

INDIAN MEDICAL SERVICE.

THE King has approved the retirement of the following officers of the I. M. S., and the grant of honorary rank as shown below:—

LIEUTENANT F. A. L. HAMMOND, in consequence of ill health: 17th March, 1919.

THE services of Major J. P. Cameron, I.M.S., are replaced at the disposal of the Government of Madras, with effect from the date on which he was relieved of his Military duties.

LIEUTENANT-COLONEL HERBERT HERBERT (retired) whose re-employment was notified in Army Department Notification No. 997, dated the 1st September, 1916, has been permitted to resign, with effect from the 1st April, 1919.

LIEUTENANT-COLONEL G. H. D. Gimlette, I.M.S. (retired), who was re-employed has been permitted to resign, with effect from the 21st April, 1919.

MAJOR G. D. FRANKLIN, I.M.S., Agency Surgeon, Southern States of Central India, held charge of the current duties of the office of Political Agent, Southern States of Central India, in addition to his own duties during the period from the 18th March, 1919, to the 1st April, 1919, inclusive.

UNDER Section 6 of the Prisons Act, 1894, the Chief Commissioner is pleased to appoint Major H. Watts, M.B., B.S., M.R.C.S., L.R.C.P., I.M.S., Civil Surgeon, Raipur, to the executive and medical charge of the Central Jail, Raipur, in addition to his own duties.

SUBJECT to His Majesty's approval, temporary Lieutenant Dharendra Lal Sarkar, I. M. S. is permitted to resign his commission, with effect from the 8th April, 1919.

THE services of Major E. W. C. Bradfield, O.B.E., M.B., F.R.C.S.E., I.M.S., are placed permanently at the disposal of the Government of Madras.

COLONEL P. CARR-WHITE, M.B., F.R.C.S., Edin., Indian Medical Service, is appointed an Honorary Physician to The King, *vice* Colonel J. Smyth, M.D., I.M.S., 31st October, 1918.

LIEUTENANT-COLONEL R. G. TURNER, I.M.S., Civil Surgeon, from Fyzabad to Mussoorie.

MAJOR J. E. CLEMENTS, I.M.S., Superintendent, Central Prison, on reversion from Military duty, to the charge of the Lucknow Central Prison.

MAJOR J. F. BOYD, I.M.S.; Military Medical Officer, Fyzabad, to hold Civil Medical charge of that district, in addition to his own duties, *vice* Lieutenant Colonel R. G. Turner, I.M.S., transferred.

LIEUTENANT-COLONEL S. C. EVANS, M.B., O.M., I.M.S., is granted, with effect from the 10th May, 1919 or from the subsequent date of relief, such privilege leave of absence as may be due to him on that date in combination with furlough on Medical certificate for such period as may bring the combined period of absence to seven months.

LIEUTENANT-COLONEL A. W. R. COCHRANE, I.M.S., Superintendent, King Edward VII Memorial Sanatorium for Consumptives at Bhowali, privilege leave for six months, combined with furlough for two months, for a total period of eight months, with effect from the date he may avail himself of it.

IN exercise of the powers conferred by clause (b) of sub-section (1) of section 4 of the United Provinces Medical Act (III of 1917), the Local Government is pleased to nominate Lieutenant-Colonel T. Hunter, I.M.S., to be a member of the United Provinces Medical Council, *vice* Lieutenant-Colonel J. M. Crawford, O.B.E., I.M.S., resigned.

Notice.

SCIENTIFIC Articles and Notes of interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements, and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscription to "*The Indian Medical Gazette*," Rs. 14, including postage, in India. Rs. 16, including postage, abroad.

BOOKS, REPORTS, &c., RECEIVED:—

Proceedings of the Kathiawar Medical Society Annual Report, South Travancore Medical Missions in India, April, 1919.
 Lawson's Text-book of Botany (Indian Edition) Revised by Birbal Sahni, M.A., and M. Willis with preface by J. C. Willis, M.A., sc.D. (Cantab), Publishers: W. B. Clive, London. University Tutorial Press. Price 8-6. 1919.
 Annual Report of the Sanitary Commissioner with the Government of India, India, 1917.
 Report on the Statistical Returns of the Provincial Lunatic Asylums of Assam, 1918.
 Note on the Lunatic Asylums of Burma for the year 1918.
 Annual Report of Chemical Examiner's Department, Bengal, 1918.
 Bulletin No. 83, 1919 Agricultural Research Institute, Pusa.
 A new Nematode causing Parasitic Gastritis in Calves: A. L. Sheather, B.Sc., M.R.C.V.S.
 Immune Sera. By Charles F. Budaun, M.D., America, and John Kornman, B.S. Fifth Edition: Messrs. Wiley & Sons, America, Chapman and Hall London.
 Pharmacy: Theoretical and Practical. By Edsel A. Ruddiman, M.D. 1st Edition: Messrs. John Wiley & Sons, Chapman and Hall, London, 1917.

LETTERS, COMMUNICATIONS, &c., RECEIVED FROM:—

Major J. W. D. Megaw, I.M.S. Lucknow; Lt.-Col. Sutherland, I.M.S., Calcutta; Ashutosh Roy, I.M.S. Hazaribagh; Capt. Stott, I.M.S., London; Lt.-Col. E. Hasell Wright, I.M.S. Coorg (2); Lt.-Col. Donald, I.M.S., Abbottabad; Capt. R. B. Seymour Sewell, I.M.S., Calcutta; Lt.-Col. Sutherland, I.M.S., Calcutta; Lt.-Col. Marjoribanks, I.M.S., Aden; Asst.-Surgn. J. F. Henriques, Blindandi; Dr. Hari Charan Gupta, Muktagacha; Director, Imperial Bureau of Entomology, London; R. R. Mole, Esq., Madras; P. B. Dana, M.B., Bombay; N. S. Narasimhan, Bombay; Lt.-Col. Turner, I.M.S., Mussoorie; Lt.-Col. T. Enticran, I.M.S., Burma.

Original Articles.

REPORT ON THE PANDEMIC OF INFLUENZA (LA-GRIPPE) IN THE PROVINCE OF COORG DURING THE YEAR 1918.

By E. HASELL WRIGHT, I.M.S.,

LIEUT.-COLONEL,

Civil Surgeon, Coorg.

INFLUENZA was first reported from the town of Virajpet, in South Coorg, and was introduced from the Malabar coast in June, but a much severer wave of recrudescence attacked the town in August with an attendant high rate of mortality, the disease spreading with great rapidity to all the neighbouring towns and villages and thence to the whole of South Coorg. The first wave of the pandemic was of a mild nature, not attended with a high rate of mortality, and lasting only about three weeks. In the town of Fraserpet (N.-E. Coorg) the disease first made its appearance in July 1918 and was introduced from Mysore. This first wave was also of a mild nature and lasted about a fortnight, to be followed by a second wave in October, a very severe recrudescence, spreading with great rapidity to all surrounding towns and villages and causing a high mortality. In Mercara the history of its spread was very similar to that of the two towns mentioned; the first wave, of mild type, reached Mercara in August 1918, lasting about three weeks; the second wave of recrudescence, in October 1918, was a very severe one; every house was attacked, the disease rapidly spread to neighbouring towns and villages, causing a high mortality, and it subsided only at the end of the year 1918. From these three centres of infection, the disease rapidly spread all over the whole province. The disease was probably introduced into Mercara from Sidapur, South Coorg. All the coffee coolies on plantations were attacked, causing great mortality and almost dislocating the work on estates, and indeed all business where the disease spread. Judging from the history of the great pandemic of 1889-1893, when it was introduced from Russia into England and was known as the Russian influenza, it would appear likely that India may again be attacked for the next few years. In that epidemic, though the disease commenced at the end of 1889, it was not till the spring of 1892 that it assumed alarming proportions and was attended with great mortality. In December 1893, it again appeared in a severe and widely diffused form and nearly every winter or spring since then it has been more or less present. There is, in my opinion, only one hope, that the trend of the epidemic, as it occurred in Coorg (and from the medical papers I have read, the disease ran a very similar course

in other towns and centres in India), is somewhat different. A first mild wave with slight mortality, followed in a few months by a very severe second wave attended with alarming mortality, the pandemic lasting nearly three months before its gradual subsidence, may point to the quicker attainment of extreme virulence of the germ cause of the disease in the tropics, in comparison with that in a more temperate zone, which may require years to attain its extreme rate of virulence. The first recorded epidemic in Great Britain is stated to have occurred in 1847-48, but that of 1889-93 was more carefully studied and described. This pandemic spread over the whole civilised world in the course of a few months. The pandemic of 1918 first arose in Spain and has been named The Spanish Influenza; thence in, few months, imitating its predecessor of 1889-1893, it has spread again over the whole civilised world. This pandemic is said to have caused 50,000 deaths in South Africa and 4,000 in Jamaica. The earliest pandemic recorded, was in 1580. It is even probable that Hippocrates described influenza. An epidemic was described by an Arabian historian in the 9th century; another epidemic is recorded as starting in the Arabian desert in 871 A.D., reaching the Mesopotamian area. In Bagdad it is said to have caused 500 to 600 deaths daily. Thirty years is given as the usual interval between the great pandemics of *la grippe*. In the epidemic in Mercara young adults were chiefly attacked, between 20 and 40 years. Infants under one year or the elderly were rarely attacked, but it may attack persons of any age and is specially dangerous in the feeble and aged. I noted that some persons were peculiarly immune to attack, though this individual immunity was rare. Only a few infants under one year were attacked, and I noticed in many European houses and those of Coorgs though whole families and servants went down with influenza, how marked was the escape of infants of 1 year and under, and this in spite of any particular attention being taken to prevent their catching the infection. There were two varieties of the disease, the mild and the severe, and three distinct types (a) the catarrhal or respiratory, (b) the gastro-intestinal, (c) the cerebro-spinal. In many cases the types were combined.

The incubation period was short—a few hours to 2 days. The onset in many cases was very sudden, without prodromal symptoms. Persons who had gone to bed quite well would awake in the morning feeling very ill and full of aches and pains, or others might be suddenly attacked whilst at work, and the disease be ushered in by a fainting fit or feeling of giddiness and weakness. Generally the first symptoms were chilliness or rigor, a feeling of weakness, headache and fever, soon followed by a feeling of nasal blocking, slight

discharge, sore throat or feeling of tightness in the larynx and a cough. Severe pains in the head, back and limbs, at times almost unbearable. In the mild type these symptoms are often scarcely noticeable. The appetite is completely lost and thirst is increased. The tongue is covered with thick greyish-white fur. The throat is very characteristic. The anterior pillar of the fauces showed a distinct red line on either side as far as the uvula. The latter is swollen and œdematous, showing distinct venules in the yellowish, gelatinous-looking uvula. The larger air tubes are generally affected but the inflammation may extend to the smaller bronchioles, causing severe coughing and dyspnoea, or small patches of pneumonia may coalesce and lobar pneumonia or pleuro-pneumonia result. The cough in influenza is very characteristic,—sudden, irritable, explosive, dry, metallic sounding, with little or no expectoration, at any rate at first. The physical signs are those of bronchitis, catarrhal pneumonia or pleuro-pneumonia. Empyema or pneumothorax was not seen, but one case developed gangrene of the lung. In the cases that came under my observation the left lung was more frequently affected than the right lung, showing signs of congestion, but in many cases both lungs were pneumonic. The breath was generally very foul. As regards the fever, there were two types—3-day or 6-day; in the mild type, rarely rising above 101° F. to 102.5° , though it may rise to 104° or 106° . The temperature is generally somewhat irregular but may resemble that of enteric in its regularity. It gradually falls to normal by lysis. In the relapsing cases the disease may resemble tuberculosis, but the tubercle bacillus is absent, whilst often Pfeiffer's *Bacillus influenza* is present—though in persons suffering from latent tubercle the latter disease is often lit up and aggravated, as is also cardiac disease, after an attack of influenza. Cardiac disease may also be caused by it.

In the cerebro-spinal type there is generally intense headache, almost unbearable, shooting neuralgias, especially of the optic nerves (with intolerance of light), and 5th nerves extending to the teeth in both maxillæ, pains along the neck, spine and back, with either insomnia or delirium, often accompanied by twitching of limbs. The catarrhal symptoms being less pronounced, constipation was the rule and the temperature was generally high.

In the gastro-intestinal type there was persistent abdominal pain, often vomiting and diarrhoea, high temperature, perhaps slight jaundice, and slight catarrhal symptoms. This variety of the disease was not often seen, though I have the notes of a few marked cases—as also of those of a combination of all three types. The association of Pfeiffer's bacillus could not be demonstrated in the gastro-intestinal type.

In many cases of influenza I noted that the commencement of the decline of the disease was ushered in by epistaxis, especially in the severe cerebro-spinal type, much to the relief of the patients' sufferings, particularly of the intense headache. I noted also that pregnant females aborted in severe cases, and that the disease frequently brought on the menstrual period. In pneumonic cases the rusty sputum was generally present, but not always; hæmorrhage from the lungs was not observed. The most frequent form of lung disease was in mild cases limited to the larynx, trachea and larger bronchial tubes, but it often spread to the smaller tubes or alveoli, causing bronchitis, patchy pneumonia, and in others broncho or lobar pneumonia; bronchitis was most frequent in children. The chief cause of mortality was from pneumonia. In infants and children the attack frequently commenced with slight coryza, or slight cold, or by vomiting, diarrhoea, headache, etc. In other children colicky pains in the abdomen and fever of a few days' duration were the only symptoms.

Diagnosis.—Though the disease attacked persons in such a variety of ways and aroused such a variety of symptoms and morbid phenomena in different organs, the toxins reacting so differently on different constitutions, it was not difficult to differentiate it after once the epidemic started, and Pfeiffer's bacillus was noted often alone or in conjunction with other organisms. There were, (1) malaria, (2) typhoid and (3) tuberculosis. The first was eliminated by microscopical examination of the blood, the second by the Widal's test and irregularity of the temperature and other symptoms, the third by the absence of the tubercle bacillus, except in those cases where phthisis was already present. I chiefly relied on the following symptoms and signs,—sudden onset; general extreme pains and neuralgias, especially intense headache; congested conjunctiva; the characteristic cough; scanty, tenacious expectoration; the typical appearance of the fauces—a valuable sign; enlarged congested tonsils, the follicles being blocked with yellowish-white secretion, the tongue coated with a greyish-white fur; the extreme prostration; patchy pneumonia; and examination of swabs from the throat, nasal passages and sputum. Pfeiffer's bacillus has been recovered from the cerebro-spinal fluid in pure culture by lumbar puncture. Complications and sequelæ,—bronchitis, broncho, lobar, and pleuro-pneumonia, nephritis. There was a trace of albumin in about 80 to 90 per cent. of the cases examined, with sometimes hyaline and granular casts, and in some cases considerably more than a trace of albumin. Neuroses. Neuralgias—a few were followed by melancholia, or cerebral confusion; probably also temporary cardiac asthenia; long continued feebleness and protracted convalescence. It is to the severity and

gravity of the *after effects* that the greatest attention had to be paid. Otitis with slight discharge was noted in some cases, also deafness—probably temporary. With reference to the statement of mortality (enclosed), it will be noted that the first mild wave was not attended with a high mortality as compared with the second wave, both in hospitals and the province. That the benefit of isolation was well exemplified in the Mercara Jail, which wholly escaped during the first wave and gave only 22 cases, late in the epidemic, with one death, in the second. The total mortality of 4,053 for the whole province during the pandemic's visitation of a few weeks is very high for so small a province. The statement must be also only approximate and does not represent the exact rate of mortality of the province during the period.

Treatment: Prophylactic.—A case occurring in a household should be isolated in a well-ventilated room, but away from draughts, to prevent the disease spreading to others, and be attended by only one or two attendants. All discharges should be disinfected with carbolic, cresol, phenyle, or other adequate disinfectant lotion, and especially the handkerchiefs, etc., used by the patient. Persons should keep in the open air as much as possible and avoid all crowded places, such as halls and places of amusement, 'busses, trains, and close contact with persons suffering from catarrhal colds. There is no doubt that the infection is conveyed by personal contact with persons suffering from the disease—by droplet infection from the saliva and respiratory excretions, and may thus be conveyed by the air, in places crowded with people, a number of whom may be suffering from influenza; though the germ-causes of the disease are said to be quickly dissipated in pure fresh air in the open. Many gargles and sprays have been recommended for the mouth, throat, and nasal passages as prophylactic during an epidemic; such as, thymol, omum water, peroxide of hydrogen, Listerine, weak solutions of perchloride of mercury, formalin (1 in 2000), carbolic acid (5 in 1000), Condy's Fluid, glycothymoline, etc. I prefer Listerine, in suitable dilutions, as a mouth-wash, gargle, or nasal douche, as well as alkaline carbolic gargles, and also advise sniffing of 40 per cent. formalin or eucalyptus, and tabloids of formamint, dressing warmly, suitable exercise in the open air, and especially to avoid catching a chill, this being a very great predisposing cause. The simple rules regarding maintenance of health, such as free action of the skin, bowels, and kidneys and, occasionally, small doses of quinine. There is no doubt in my mind of the value of quinine in influenza, both as a prophylactic and curative drug.

Treatment during the attack.—The patient should immediately go to bed until all fever

and symptoms subside, and be under proper medical advice. The symptoms grow worse every minute he is up and about. He should wrap up warm, away from draughts, but in a well-ventilated room. The diet should be principally milk—milk with alkaline waters. Home-made lemonade and orange juice are useful to allay thirst. He should have plenty of pure water, especially in the gastro-intestinal forms, and where albumin and casts are observed in the urine.

As regards medical treatment, this is chiefly symptomatic. But the scheme I generally adopted was as follows:—After an initial calomel purge (1 to 2 grains), followed by a seidlitz powder or *mistura alba* in the morning, to order salicylate of soda, salicin or, better, aspirin in alkaline mixture, three times a day for the first 2 or 3 days; or in severe cases with high fever, a draught of 10 to 15 grains aspirin in $\frac{1}{2}$ to 1 ounce of good brandy, and 2 to 3 drachms of liquor ammoniæ acetatis in an ounce and a half of distilled water. These lessened all symptoms and reduced the temperature; but the depressing nature of these drugs and the free perspiration caused has to be borne in mind, the drug discontinued as soon as possible, and the patient placed on quinine 1 to 3 grains in effervescence with citrate of potash, carbonate of ammonia and potassium bicarbonate—the dose to be repeated every 2, 3 or 4 hours, as required.

In a number of cases, I have found 1 grain of hydrobromate of quinine and 1 grain of phenacetin given hourly for 4, 6 or 8 doses very beneficial, especially in pneumonic cases; but chlorine and quinine were more useful in the gastro-intestinal type. Where there was vomiting and diarrhoea, food was lessened or almost withheld for a time, and a bismuth-alkaline dose given occasionally, to which liquor morphia was added if there was much pain in the abdomen. In fact the gastro-intestinal type was treated on the same lines as a case of enteric. Pneumonias were treated on the same lines as croupous pneumonia, but special means must be taken to thin the tenacious mucus and enable the patient to expectorate it and clear the air passages. Hot milk with an equal quantity of an alkaline water and 1 to 3 teaspoonfuls of brandy is good—also ammonium chloride, 10 grains, carbonate of ammonia, 5 grains, soda bicarbonate, 5 to 10 grains. Tincture senega, $\frac{1}{2}$ drachm in an ounce of chloroform water, acts as a good expectorant.

Local Treatment.—Mustard poultices, turpentine liniment, iodine tincture and liniment, or fomentations, sprays or gargles of listerine to the mouth, throat, or nasal passages. Inhalations of glycerine *cum* carbolic acid with spirit of camphor, tincture benzoin co., and $\frac{1}{2}$ ounce spirit of chloroform 30 to 60 minims, in a jugful of

hot water, is very soothing and allays cough. Tincture iodi., $1\frac{1}{2}$ drachm with glycerini alumnis, $\frac{1}{2}$ ounce, was used with marked success for the throat.

The following linctus for the irritable dry cough was very successful; Liquor morphiae hydro., minims vi; acid hydrocyanic dil., minims 2; oxymel scillae, 1. dram; syrup tolu, 1 dram; sp. chloroform, minims 10; to be repeated after 4 or 6 hours, if necessary—not more than 2 doses daily. It was much appreciated by patients.

For insomnia, sodium bromide, paraldehyde, and in severe cases an occasional hypodermic injection of $\frac{1}{4}$ grain of morphia at bed-time, was successful; also 1 ounce to $1\frac{1}{2}$ ounces of good brandy or whisky and water acts as a good soporific at bed-time. Otitis was treated by warm vapour of chloroform and tincture of iodine. The neuralgia and pains by anodyne liniments and ointments.

Blotting paper soaked in eucalyptus placed about the sick-room freshened the air and tended to antisepticise it—also small cotton balls with a few drops of eucalyptus attached to childrens' cots acted similarly.

During the attack, cardiac asthenia has to be constantly borne in mind and the serious after-effects of depressing antiperiodics were avoided as much as possible. Complete rest for at least 6 or 7 days after the fever and symptoms had subsided was recommended. Both in hospital and in private cases, this was often disregarded. In hospital, patients absconded 3 or 4 days after recovery, only to return with a very serious relapse, which in many cases proved fatal; most of the cases that died in hospital were due to this cause or, to neglected cases suffering as well from ancylostomiasis, malaria or enlarged spleen and other diseases. Many were brought in a moribund state. Similar relapses occurred in private houses, where those, in spite of warning, got up too early and moved about. However I was fortunate not to get a single death amongst the Europeans and better class Coorgs whom I attended, though, as stated before, no house or family escaped attack. Therefore prolonged rest is imperative after an attack, both mentally and bodily. Patients should not leave bed for 7 days and not return to work for at least 10 to 14 days thereafter. Strychnine—combined with prolonged rest—is the best tonic for cardiac asthenia. It may be given with iron and quinine. In some cases digitalis and iron in full doses acts well, also the glycerophosphates. Serious syncopal forms may require hypodermic injections of strychnine, caffeine, or ether.

In a number of cases I noticed a polymorphic rash. This, together with germs noticed, is briefly described with the few charts at the end of the report. After the symptoms have generally subsided and the period of prolonged rest

enforced, gentle exercise in the open air and a change of air to the seaside or hills are beneficial and accelerate recovery. In chronic neuralgias and neuritis, with muscular atrophy, besides analgesics and anodynes, electricity and massage are useful. Full doses of strychnine and of iron, fresh air and sunshine, and change of climate are necessary for recovery, and especially careful and suitable feeding. A case in hospital of combined cerebro-spinal and respiratory influenza (pneumonia) developed complete paraplegia with mild delirium, the case ending fatally. Of all the domestic remedies tried by me the only one that I found useful was pepper and garlic. This was tried in mild cases and certainly proved useful. In some cases of chronic laryngitis nitrate of silver (grains v to x to one ounce aqua) applied to the throat, followed by swabbing with tannate of glycerine once or twice a day, succeeded.

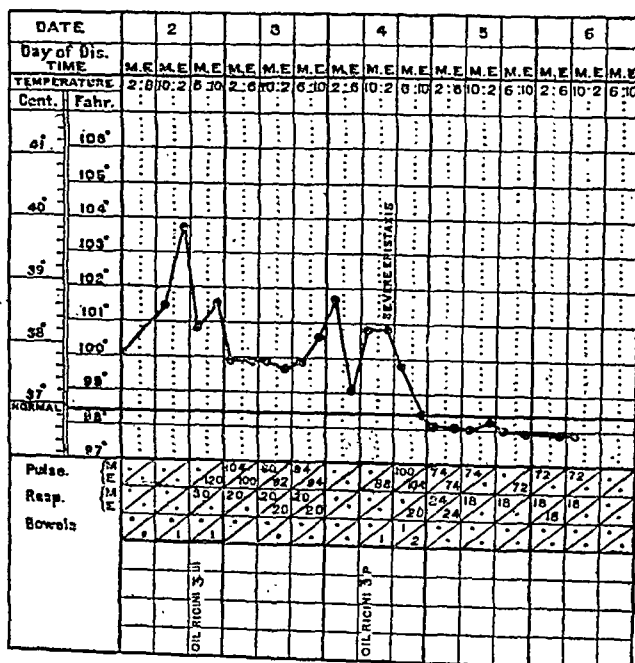
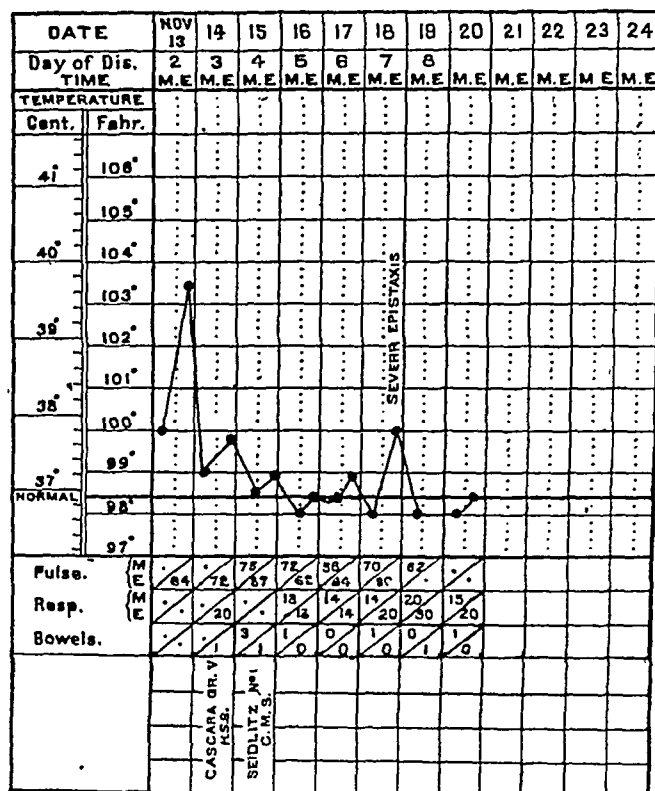
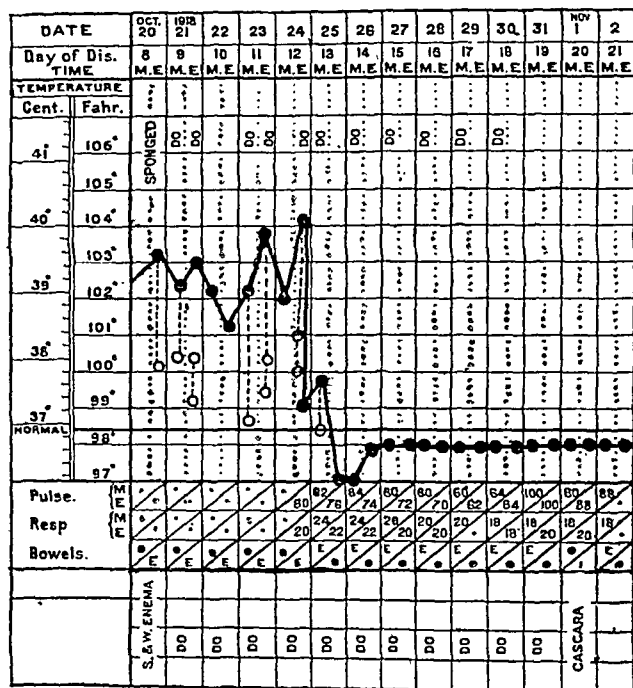
Recurring rigors were noted in some cases. Sub-normal temperatures and slow pulses (as low as 48 per minute) were noted during convalescence and remained for some days after the attack had subsided, pointing to excessive toxæmia, and the effect of the toxins on the cardiac muscle. Recently a polyvalent vaccine of a mixed influenza vaccine has been prepared by Messrs. Burroughs, Wellcome & Co. as a preventive and curative, and a similar vaccine, I understand, has been brought out in America, and may prove to be of great value.

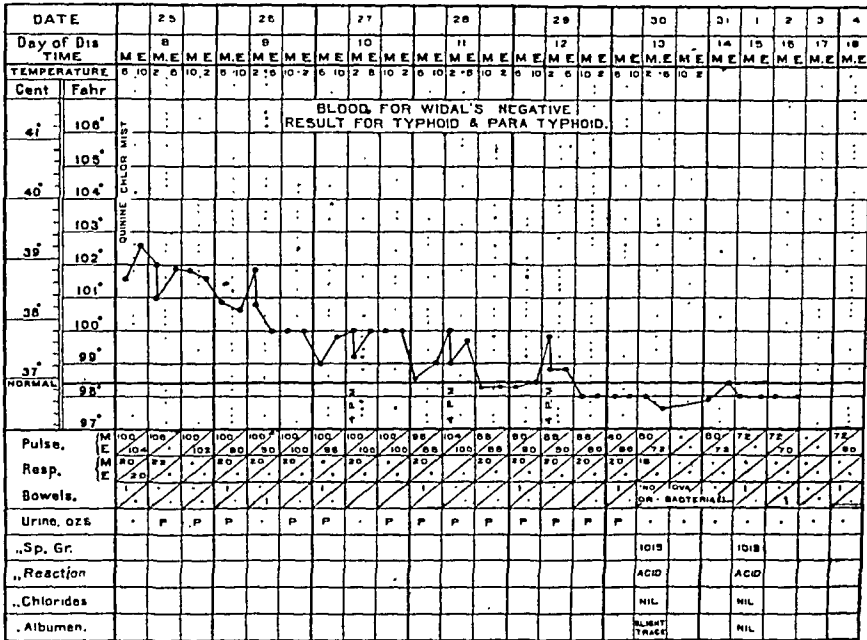
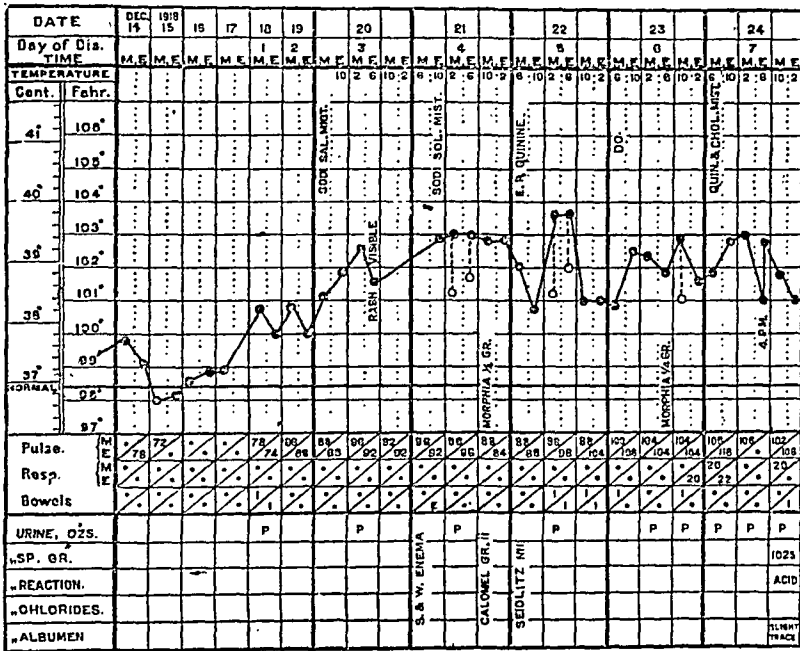
BRIEF REMARKS ON TEMPERATURE CHARTS OF CASES.

Case No. 1—shows a relapse due to too early moving about after a mild attack of 3 days' fever, and refusal of proper nursing. She was placed on salicin and alkalies for 2 days, but the temperature remained high, and the left lung was pneumonic. Phenacetin and quinine, 1 grain of each, acted very well in this case. Bromide of sodium for delirium and sleeplessness acted well at first, but had to be replaced by $\frac{1}{6}$ grain of morphine hypodermically for one or two nights, and this relieved all symptoms. Recovery was ushered in by epistaxis, which immediately relieved the intolerable headache. A polymorphic rash was noted, chiefly erythematous patches, papules and miliary forms. Some of the patches were raised and almost urticarial, and were chiefly seen on chest abdomen, back and arms. Strychnine, iron and quinine was useful in convalescence, but the patient did not thoroughly regain his health for weeks.

Case No. 2.—This case occurred in my own house, all the inmates of which were attacked. The classical signs of an influenzal attack were present, the ordinary scheme of treatment was adopted, especially prolonged rest after the subsidence of fever. The decline was ushered in by epistaxis; convalescence was again protracted.

Civil Surgeon, Coorg.

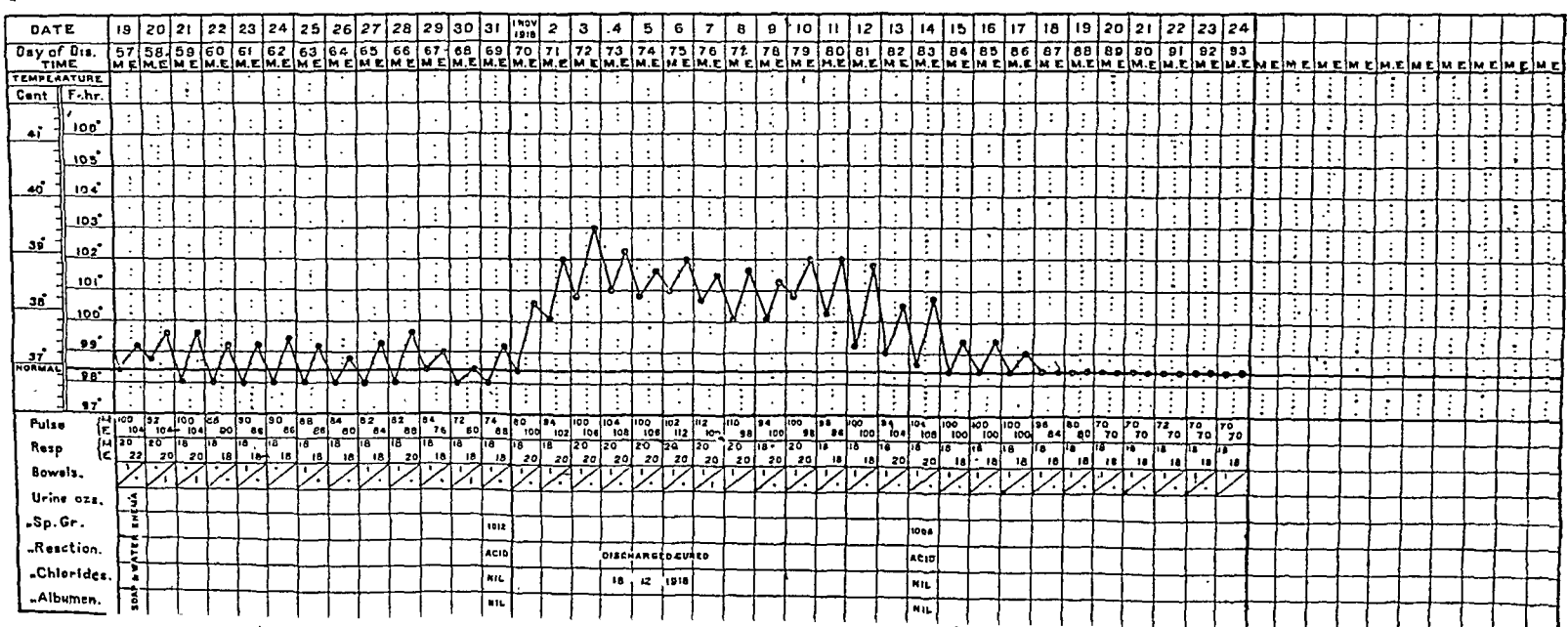
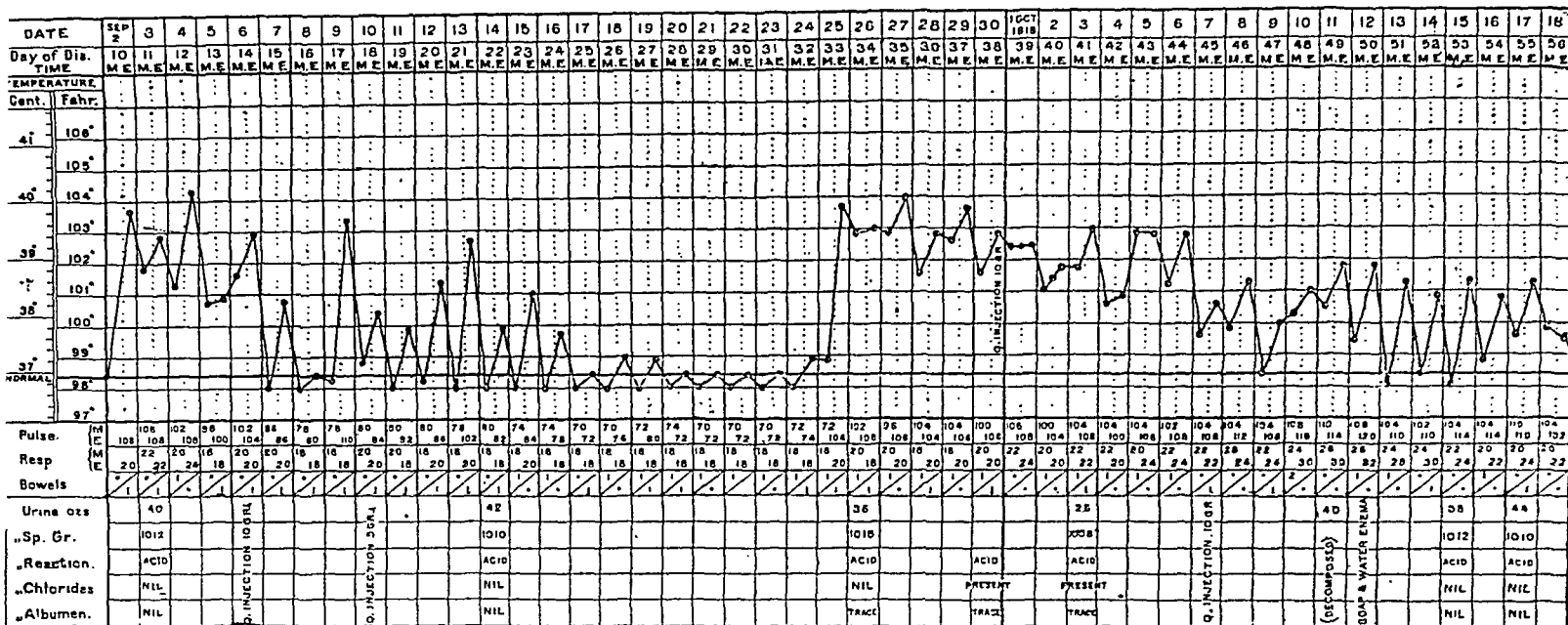


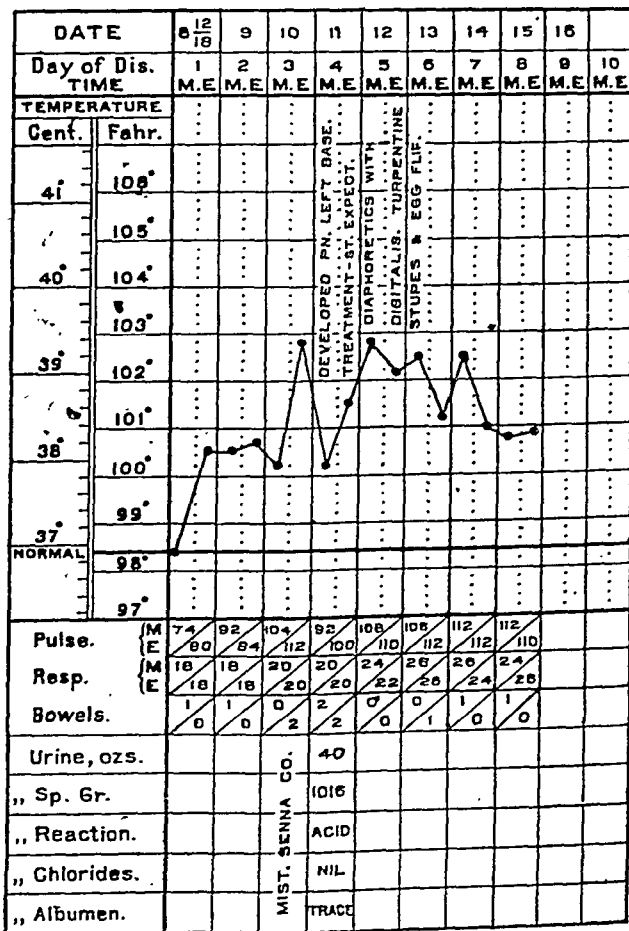
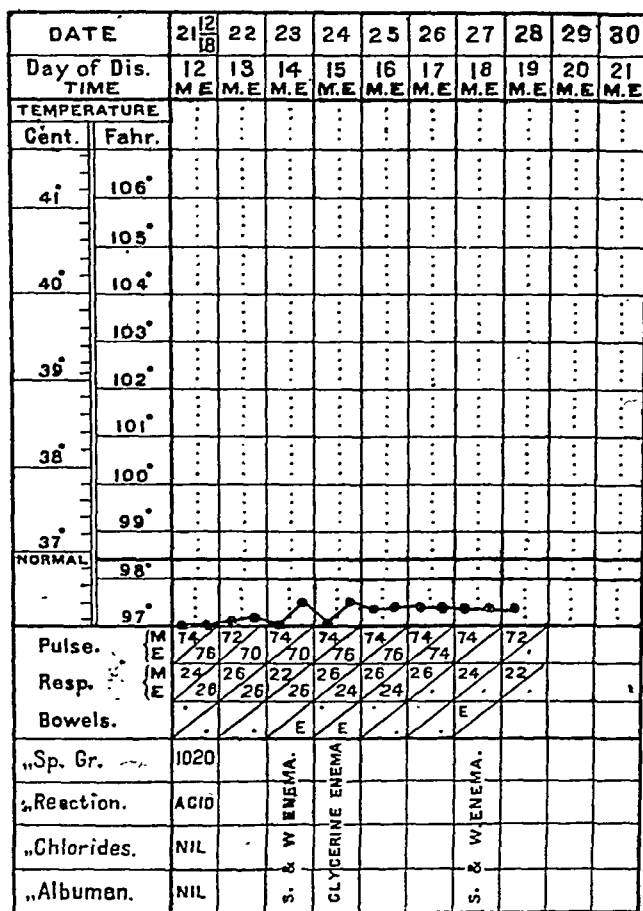
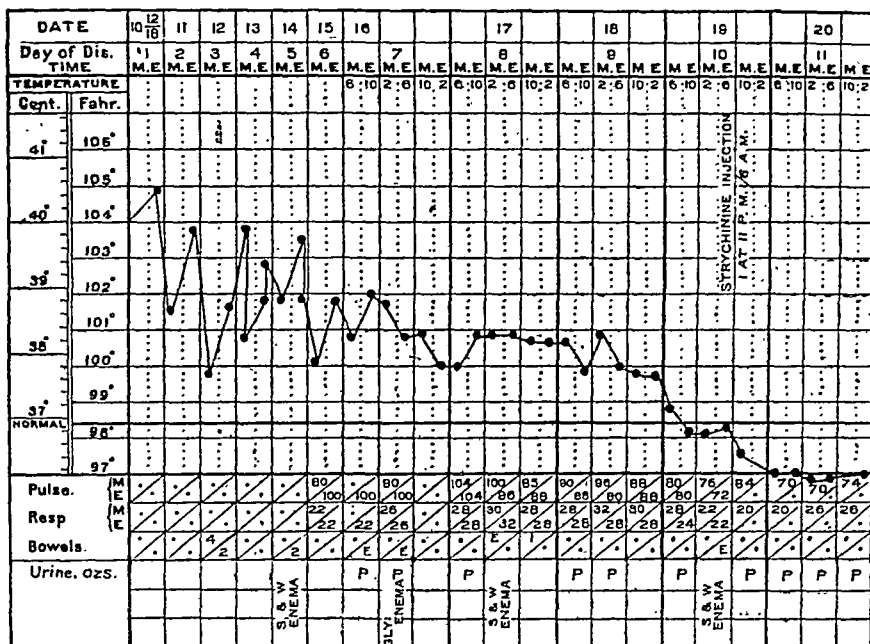


REPORT ON THE PANDEMIC OF INFLUENZA (LA GRIPPE) IN THE PROVINCE OF COORG DURING THE YEAR 1918.

By LIEUT.-COL. E. HASSELL WRIGHT, I.M.S.,

Civil Surgeon, Coorg.





Case No. 3—was a case of relapse, who was allowed up too soon, four days after a three-days' fever; the primary attack was typically respiratory, the second attack was chiefly cerebrospinal. A rash was noted in this case and commencement of recovery was ushered in with epistaxis.

Case No. 4—occurred in the case of an officer of the Coorg Commission. He had a primary typical attack with four days' fever, and against warning got up on the third day of the apyrexial period with, as a result, a very serious relapse. On the fifth day the type of fever resembled enteric to some extent but was more irregular, the nurses in attendance, who had not been entertained in the first attack, firmly thought the case was one of enteric, and I have seen both diseases combined, but in this case the Widal's reaction was negative, as noted in the chart. The similarity was enhanced, when a rash was noted on the seventh day of the relapse, papular, miliary, and erythematous; one large patch triangular in shape over the left lower ribs in the splenic region, over abdomen, chest, arms and back, also the presence of a few rose-red spots on the abdomen, chest and back, disappearing on pressure—this latter I eventually put down to flea-bites, the remainder to the influenza rash. I had as guidance of course the initial attack, but there were, besides, other differences. The tongue was coated with greyish-white fur and not strawberry-looking. The appearance of the throat, was somewhat characteristic of the influenza throat, the headache was neuralgic, there were nerve neuralgias, excessive pain in neck and in the course of the spine, great pain in the epigastrium, no gurgling in the right iliac fossa nor tympanitis, the evacuations, were dirty grey-brown, the pyrexia irregular, the nature of the pulse, etc. This case was treated in the same way as an enteric case, except that calomel and purgatives were given, but later this was abandoned and replaced by enemas. Bromide of sodium, and occasionally morphia hypodermically, relieved the restlessness, delirium and insomnia. There was great cardiac asthenia and prostration and a protracted convalescence; the patient has not yet regained his health and strength. He was kept in bed for 14 days after temperature became normal.

Case No. 5.—An interesting case of relapsing influenza, in a convict in the Divisional Jail, Mercara, at first admitted for bronchial asthma, with two relapses. First relapse, on 25th September, treated as a case of enteric. Second relapse treated in a similar manner. Gastro-intestinal influenza diagnosed, especially noting the nephritis with albuminuria. Granular and hyaline casts, irregular temperature, pulse and other signs. The presence of the pandemic's second severe wave, etc. Prolonged convalescence, cardiac asthenia and extreme weakness that

remained long after subsidence of the attack. The case was discharged cured on 18th December, 1918.

Case No. 6.—This case was a relapse after a mild attack, getting up on the fourth day after temperature had reached normal; and attending a garden party on one of the coldest evenings of the year 1918.

Case No. 4—was also present that evening and I concluded that infection was conveyed from Case No. 6 to Case No. 4 the same evening, as both cases fell ill much about the same time. In Case No. 6 there was pleuro-pneumonia of the left lung followed by extreme cardiac asthenia, subnormal temperature, and extreme weakness. The case eventually recovered but is still not completely convalescent.

Case No. 7.—This female convict was admitted into the jail in indifferent health on the 2nd July, 1918, suffering from ancylostomiasis, with severe anæmia. She underwent the usual course of prophylactic treatment prescribed in this jail, and subsequently that for ancylostomiasis. Ova of ancylostomes, trichuris, trichiura, and oxyuris were noted in the fæces. After thymol no ancylostomes were noted, but some thread worms were passed. She greatly improved as regards anæmia and gained weight. She was admitted for a typical attack of influenza on 8th December, 1918 (another female convict being attacked at the same time), the infection having been brought in by the female warder, who with her daughter had been admitted into the Civil Hospital for the same disease. These cases occurred late in the epidemic in the jail when all other cases had been discharged cured. Slight patchy pneumonia of the left lung was noted, and all the symptoms of influenza were present, especially the characteristic appearance of the throat. She died at 11 A.M., on 16th December, 1918, somewhat suddenly from cardiac failure. This was the only fatal case that occurred during the influenza epidemic in the jail, and in fact was the only case that died amongst the prisoners in the Mercara Jail for the whole year 1918. The patches of pneumonia caused coalescence of the upper and lower lobes. On physical examination these showed signs of pneumonic consolidation, the upper lobe that of congestion. The right lung showed signs of congestion only. On examination of the urine, there was a distinct trace of albumin at first, but it soon cleared up. On examination of sputum stained with carbol-fuchsin (1 in 10), pneumococci, Pfeiffer's bacillus influenzae, and diplococci were noted. On the 14th December, 1918, cardiac asthenia was well marked and slight cardiac dilation was observed. The pulse was soft and weak in tone but fairly regular and there was also nocturnal delirium; from this date she was almost continuously delirious with gradual

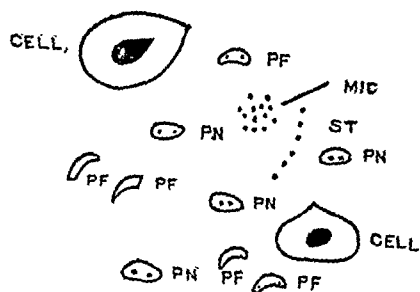
increase of feebleness of pulse and cardiac symptoms. The respiratory passages were blocked with secretions. She had not sufficient strength to expel them and grave toxæmia in spite of all treatment resulted.

Post mortem.—The pericardium contained one ounce of fluid. Right side of heart dilated. Right ventricle contained a large pale clot. Right auricle filled with a pale clot. Left auricle with small pale clot. Left ventricle contained a pale clot. Valves normal, patent. Heart was generally enlarged and dilated, fatty, and weighed 12 ounces.

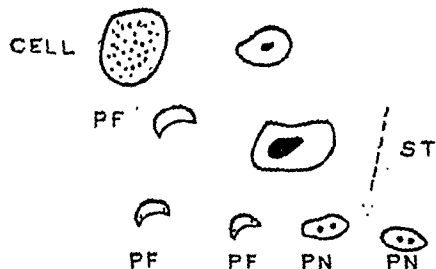
Thorax.—Pleuræ not adherent. Right lung, greyish in appearance. Lower lobe, congested. Crepitant to the touch. Section: compressed, exuded frothy fluid. Portions float in water.

Left lung.—Base markedly congested, solid to touch, portions sink in water, apical simple congestion, weight 1 lb. 8 oz. Patches of congestion and slight hæmorrhages in larynx, trachea, and larger tubes, which were choked with pneumonic secretions.

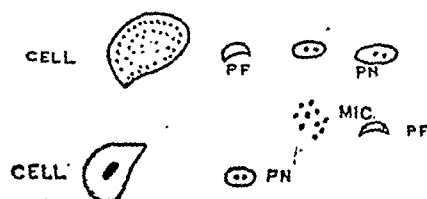
Spleen, slightly enlarged. Four whip-worms removed from cæcum. Kidneys, capsule not adherent, slight congestion, otherwise normal. Membranes of the brain and brain substance congested, especially on the left side.



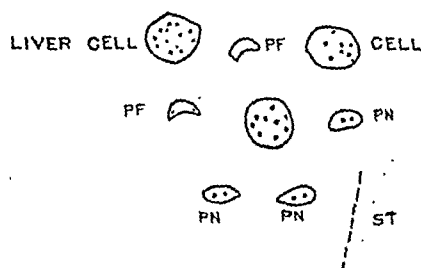
Lung smear—carbol-fuchsin (1 in 10), enlarged and diagrammatic. (Stained for 10 minutes.)



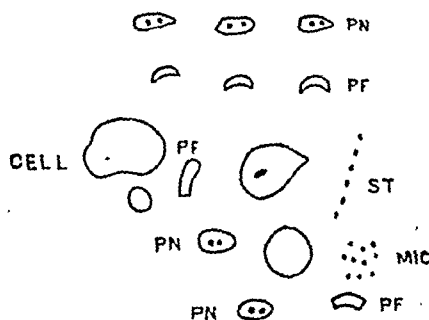
Throat smear—carbol-fuchsin (1 in 10), enlarged and diagrammatic.



Liver smear—carbol-fuchsin (1 in 10), enlarged and diagrammatic.



Spleen smear—Leishman stain (1 in 10), enlarged and diagrammatic.



Brain—membranes and cerebrospinal fluid (1 in 10), enlarged and diagrammatic. Leishman stain.

The blood showed leucopenia and slight neutrophilia during the height of attack, and leucocytosis during convalescence.

SUMMARY CONCLUSIONS: RECOMMENDATIONS.

Pfeiffer's bacillus influenza was discovered in 1892 and was regarded as the principal etiological factor in the great pandemic of 1892 and 1893, though the present pandemic would tend to show that Pfeiffer's bacillus is not the only germ which causes influenza and pneumococcus influenza,—cases due to the micrococcus catarrhalis, to the streptococcus, etc., perhaps in conjunction with Pfeiffer's bacillus, have been described. The latter occurs in large numbers in the mucopurulent discharges from the respiratory passages, at times to the exclusion almost of other germs. In other cases few bacilli or none are noted, being overlapped by pneumococci, diplococci, micrococci, etc. Pfeiffer's bacilli are very small, curved, sausage-shaped rods, staining more deeply at their rounded, extremities; they possess an almost transparent diaphanous capsule, and require very careful adjustment to detect them. I have found they stain best with Loeffler's alkaline methylene blue, or carbol fuchsin (1 in 10). In the great pandemic of 1889-93,

REFERENCES.

- PN=Pneumococci of Fraenkel (diplococcus pneumoniae), possibly pneumococcus of Fraenkel (Micrococcus lanceolatus).
 PF=Pfeiffer's bacillus influenza (bacilli morphologically indistinguishable from Pfeiffer's bacillus influenzae).
 ST=Streptococci.
 MIC=Micrococci, possibly Micrococcus catarrhalis.

Pfeiffer and others found in the nasal and bronchial secretions pure cultures of the influenza bacillus in all uncomplicated cases; and subsequent reports indicated that the influenza bacillus is a common invader of the air passages in a large group of other diseases, *e.g.*, whooping cough, phthisis, measles, etc. In this pandemic and subsequently, the pneumococcus influenza has been described, the pneumococcus being the chief germ observed, sometimes in conjunction with other germs, as the streptococcus staphylococcus,—these cases showing a minority of Pfeiffer's bacilli. The latter bacillus is known to lie dormant in the respiratory passages, especially in the antrum of Highmore, frontal and other sinuses of the nasal passages, the mouth, and respiratory secretions, resembling in this respect other respiratory germs. The period given, 30 days from the commencement of the attack of influenza, when the patient ceases to be infective, rather points to its latency and capability of virulence being resuscitated and causing a relapse, or in those long-standing cases which harbour the germ for years, after the pandemic has passed, being responsible for the yearly sporadic, epidemic, or pandemic recurrences. It is a protean disease, and I would argue that the bacillus influenza is probably the primary originator of the epi or pan-demic outbreaks; but may be overgrown by the organisms already present in the respiratory tract, such as the pneumococcus, micrococcus, diplobacilli, streptococci, etc. The history of the cause being due to a cold wave from the North, may not mean an atmospheric cause, but rather to its action, lighting up the virulence of the bacillus in persons whose vitality has been lowered, mentally or physically, by, say, famine, severe epidemics, war, etc. Such a cause was given in the older pandemics in Europe, and also in England in the periodic recrudescence in the early spring and autumn, due to cold, damp, muggy weather. I think that it is reasonable to presume that pandemics of influenza are thus started from a local focus, where the latent bacillus influenza has been reinforced in virulence from time to time by the less important sporadic and epidemic cases, until some determining factor starts the great pandemic, which spreads so rapidly over the world, increasing, in its course, the virulence of other respiratory germs, which eventually almost supersede the original *B. influenzae*. As regards prophylaxis, I would lay stress on free ventilation, life in the open air, avoidance of overcrowded rooms or places of amusement, etc., being suitably clad, and especially avoidance of catching chills and by following the general rules of maintenance of health.

Of the various gargles, mouthwashes, nasal douches recommended, I found Listerine as the most useful, secondly perchloride of mercury (1 in 1000 or 2000) mixed with an equal quantity of glycerine; and boroglyceride also was useful, as well as tabloids of formamint. That such a line of asepsis is useful both before and during convalescence is shown in the fact that in many cases relapses are due to reinfection from buccal, pharyngeal, and nasal secretions, in some cases causing otitis media with extension to the brain and ending fatally—which might have been prevented,—or relapses with fatal complications. The use of an aromatic and antiseptic dentifrice is also beneficial, and the sniffing of 40 per cent. formalin or of eucalyptus as well. I have found small doses of quinine, preferably in effervescence, in occasional doses, decidedly beneficial.

The general treatment, symptoms, diagnosis, etc., of the attack has been described in the body of the report, but I would briefly emphasise the following points: Immediate rest in bed, as soon as attacked and to remain there, under supervision of the medical man, with careful nursing in the severer types. The necessity of rest in bed during convalescence for at least 5 or 6 days after fever and symptoms subside, especially in those cases, showing albuminuria and casts. The nephritis usually passes off fairly early, but may remain for 3 weeks or more, during which the patient should not get up and move about but should take complete rest. A patient should not resume severe mental or physical work for at least 14 days after convalescence. Careful dieting; milk diet with a liberal allowance of pure water, to dilute the toxins and to flush the kidneys, combined with imperial drinks, home-made lemonade, and fruit juices. There should not be too frequent examinations, of the chest or other physical examination, remembering the extreme effect of the toxins on the cardiac muscle, cardiac asthenia and grave after-effects. One should also take care that the patient is slowly moved, as required, for the examination. Patients have been known to succumb after being raised to the sitting position either during the examination or soon after.

Salicin, salicylates, aspirin, in alkaline and stimulating draughts, are of value for the first two or three days, followed by small doses of quinine (1 to 3 grains) in effervescence, or of hourly doses of phenacetin and quinine, 1 grain of each in some cases; chlorinated quinine mixture in gastro-intestinal cases, tincture strophanthus or full doses of digitalis and iron and ammonia as cardiac tonics, especially in pneumonic cases. Stimulants are not generally required as a rule in the early stages, but should be reserved for convalescence, good sound port or champagne

being the most useful. I would also emphasise the combined value of strychnine—strychnine combined with iron, quinine or arsenic—during convalescence. Prolonged rest is necessary after an attack, not only in severe but even in the mildest cases,—a period of not less than 6 days,—change of air, and no return to severe mental or physical work till some time after complete recovery. The best diet during convalescence is fish, eggs, chicken, with an ample supply of vegetables. The vaccines prepared in previous epidemics are said not to have met with conspicuous success, but the more recent polyvalent vaccines may prove of great value. The latest experiments undertaken with reference to a filterable virus as a cause of influenza promises to throw some light on the etiology of the disease.

In conclusion, I would strongly recommend the establishment of a small Research Laboratory, at Mercara, small but adequate and efficient—sufficient for the requirements of a small province like Coorg,—and still smaller ones in Somwarpet, in north Coorg, and Virajpet, in South Coorg. They could be attached to the hospitals in these towns. The province of Coorg lends itself admirably for scientific investigations. It is the home of malaria, dysentery and other similar diseases. Small-pox is prevalent every year, and epidemics of plague, cholera, etc., are often introduced into the province. Anchylostomiasis is very prevalent, especially amongst the plantation coolies and poorer classes. The percentage of admissions for anchylostomiasis in the Divisional Jail, Mercara, is at the rate of from 90 per cent. to 100 per cent. yearly, and often a monthly average of 100 per cent. The investigation staff might combine with the sanitary

staff for improvement of sanitation in rural areas and general health, as proposed by the Sanitary Commissioner to the Government of India. Such a staff could investigate the causes of diseases, epidemics, the management of the same, vaccination, supervision of vaccination, statistics, etc., to be combined with travelling dispensaries, the inspection of all schools, and general sanitary improvements in towns and rural areas. Such a scheme would be of inestimable benefit to the province of Coorg. Of course, the only difficulty would be the question of expense.

Enclosures.—Map of Coorg, showing places referred to in the report, (2) Tabular statement of mortality, (3) Charts of seven cases of influenza, (4) Note on the prevalence of the new disease (influenza) in Coorg.

Statement of Mortality from Influenza in the Hospitals of Coorg.

Hospitals.	1ST WAVE.			2ND WAVE.		
	Admitted.	Cured.	Died.	Admitted.	Cured.	Died.
Mercara ...	6	6	..	245	210	35
Mercara Jail	...	...	...	22	21	1
Virajpet	11	9	2	221	188	33
Somwarpet	12	6	6	39	37	2

Statement showing the Mortality from Influenza in Coorg.

TALUK.	MERCARA.		PADINALK-NAD.		YEDENALK-NAD.		KIGGAT-NAD.		NANJARAJAPATRA.				Total in Towns.	Total in Rural Areas.	GRAND TOTAL.
Areas.	Mercara Municipality.	Rural Areas.	Murnad.	Rural Areas.	Virajpet.	Rural Areas.	Ponnampet.	Rural Areas.	Kodlipet.	Fraserpet.	Somwarpet.	Rural Areas.			
1st Wave ...	5	37	14	28	10	36	24	8	2	3	5 to 10	65			
2nd Wave ...	44	486	111	245	98	403	190	614	14	19	31 to 64	1,511			
Total in Towns	49	...	125	...	108	...	214	...	74			..	570	...	...
Total in Rural Areas	...	523	...	273	...	439	...	672	...			1,576	...	3,483	4,053

Deaths registered from Influenza in the Towns and Districts till the end of November, 1918.

Serial Number.	Districts and Towns.	Population according to the census of 1911.	Influenza.	Ratio of deaths per 1000 of population.	SEX.	
					Male.	Female.
1	2	3	4	5	6	7
<i>Districts.</i>						
1	Mercara Taluk	20,335	546	26.85	325	221
2	Padinalknad "	26,867	444	16.53	236	208
3	Yedenalknad "	37,513	433	11.54	249	184
4	Kiggatnad "	39,767	847	21.21	408	439
5	Nanjarajapatra "	40,513	974	24.04	501	473
	Total ...	164,995	3,244	19.67	1,719	1,525
<i>Towns.</i>						
1	Mercara ...	6,269	49	7.82	29	20
2	Virajpet ...	3,712	89	23.98	57	32
	Total ...	9,981	138	13.83	86	52
	Total of Province Coorg ...	174,976	3,382	19.33	1,805	1,577

A NOTE ON THE PREVALENCE OF THE NEW DISEASE (INFLUENZA) IN COORG: SYMPTOMS, TREATMENT AND PREVENTION.

BY E. HASELL WRIGHT,

LIEUT.-COL., I.N.S.,

Civil Surgeon, Coorg.

INFLUENZA is a highly infectious and, in the severe form, dangerous disease, which spreads with remarkable rapidity, by direct contact with persons suffering from the disease, chiefly through the medium of the nasal discharge, sputum or saliva; but it is also spread through the air, especially in crowded rooms, or places where numbers of persons are collected together, some of whom are suffering from influenza.

Symptoms.—The incubation period is very short—one to two days. The onset is strikingly sudden. A patient may go to bed apparently quite well and wake up complaining of body pains, headache, and feeling generally ill, or he may be at work, when he suddenly feels violently giddy and may fall down in a state of collapse. The two usual first symptoms are a slight feeling of chilliness, and malaise, which quickly become worse, each minute the person remains up and about. A violent headache soon follows, and a feeling of tightness and soreness of the throat and nose with a dry cough. The second day of the disease finds the patient worse, with a good deal of intolerance to light, causing pain in the eyes.

There is a great tendency to sleep the whole day. The appetite is quickly and completely lost. The bowels are generally confined. Marked gastro-intestinal symptoms are rare, though there may be violent vomiting and diarrhoea and collapse something like cholera. The pains are most severe in the back, head, joints, and bones, but in all cases there is marked prostration.

Colicky pains in the abdomen, together with fever, may in some cases be the only symptoms. The third day as a rule will see an improvement in the general feeling of discomfort, though other signs are more marked and the cough troublesome. Back-ache may be very severe. By the fifth day the patient feels very much better, the appetite returns, and headache and intolerance of light are absent or only slight. The morning of the fifth day marks the commencement of convalescence. The patient feels quite well and the appetite is keen. A good deal of weakness remains and if the patient is allowed up before the sixth day, he may feel very giddy, faint and sick. The convalescence is very slow and patients do not regain strength for 10 to 14 days after they are up.

The chief signs are,—(1) Slight catarrhal symptoms, running of the nose, slight cough, and a feeling of tightness of throat. (2) A toxic (unhealthy complexion) appearance. (3) A heavily-coated tongue. (4) Redness of conjunctivæ. (5) Signs of acute inflammation of mouth, gums, nose and throat, the mucous membrane looking highly inflamed and red. (6) Severe headache, pains in the back bones, and joints. (7) Fever, which is the highest on the second or third day. There are two types of fever—(a) a three-day fever and (b) a five-day fever. (8) A marked feeling of depression, lassitude and exhaustion. There are three types of the disease:—

(a) The Catarrhal (Respiratory)—most common.

(b) The Cerebro-spinal.

(c) Gastro-intestinal.

The complications are bronchitis, broncho-pneumonia, pneumonia, and pleuro-pneumonia. The urine is generally high-coloured, passed in much less quantity than normally and contains albumin in 90 per cent. of the cases. This is important, as patients should not be allowed to be up and about or working as long as this is present. There is sometimes slight enlargement of the spleen.

Treatment.—A person attacked with influenza should immediately go to bed and remain there until all fever and symptoms subside, and be under proper medical advice, as the symptoms grow worse every minute that he is up and about. He should be wrapped up, warm and away from draughts, in a well-ventilated room. The diet

should be milk, milk and soda water or apolinaris. Home-made lemonade can be given for thirst, orange juice is also beneficial but it should be strained. Aspirin and salicylate of soda are decidedly useful during the first two or three days of the disease. Ten grains of aspirin may be given three times a day for the first two days and, in severe cases, accompanied by high fever, fifteen grains of aspirin, in half to one ounce of brandy and water, and three drachms of liquor ammoniæ acetatis. Is often markedly effective. If tabloids are used, they should be crushed before being dissolved. I have found the following mixture very effective during the first two or three days:

Sodæ salicylatis, grains ten,
Sodæ bicarb., grains five,
Sp. ammoniæ aromaticus, minims fifteen,
Liq. ammoniæ acetatis, drachm one,
Syrup tolu, drachm one-half,
Chloroform water, one ounce,

to be given every fourth or sixth hour during fever only. As soon as symptoms subside, quinine should be given in 3- to 5-grain doses three times a day, in mixture. The mouth and throat require attention. Mouth-washes and gargles are very useful—such as boroglycerid listerine, glycothymolin, alkaline and glycerine of carbolic gargles, and Condy's fluid gargle.

Inhalations are also useful—such as Friar's Balsam, eucalyptus, etc. Complications, such as pneumonia, etc., should be treated on medical principles.

During convalescence the best diet is eggs, fish and chicken with an ample allowance of fresh vegetables and fruit. There should be freedom from hard work for at least 10 to 14 days after the attack.

Preventive.—If a case occurs in a household, he should be isolated, to prevent others contracting the disease, and should have only one or two attendants. All discharges should be disinfected with carbolic lotion or phenyle, etc., especially handkerchiefs used by the patient. People should avoid crowded rooms, etc., be in the open air as much as possible, and avoid close contact with persons suffering from catarrhal colds.

Gargles of thymol or omum water are considered effective in keeping off the disease, as well as inhalations of eucalyptus; also very weak solutions of formalin (1 in 2000) or carbolic acid (5 in 1000) used as a spray or gargle.

The simple rules regarding maintenance of health should be carefully followed—such as maintaining free action of the skin, regulating the action of the bowels and, most important, avoiding chills, as the latter is a very important predisposing cause.

THE TREATMENT OF SYPHILIS AND THE WASSERMANN REACTION THEREAFTER.

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LIEUT.-COLONEL, I.M.S.,

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IN the June number of the *Indian Medical Gazette*, a paper appeared by Sutherland and Mitra on the Wassermann reaction in syphilis. From the point of view of the physician who has to treat these cases, the most important part of the article is in the last paragraph. It runs: "We have been struck by the number of cases in which the Wassermann reaction was not easily and favourably affected by treatment, because the physician in charge of the case had pushed organic arsenic, but neglected mercury as a means of treatment, etc."

This statement is absolutely correct. Through the courtesy of Colonel Sutherland, a large number of my private and hospital cases have been examined in the serological laboratory at the Medical College, Calcutta, and it is possible that the dictum quoted by me is based in part on the blood results obtained from my cases.

In the course of each year a large number of syphilis cases pass through my hands, private cases, European sailors, and Indian policemen. Records are kept of these as far as possible, but, with a shifting population, patients are not easily followed up, particularly two or three months after the termination of the treatment.

In the case of the Police, however, matters are different. The men are to some extent disciplined and can be kept in hospital for any reasonable period.

I have treated over 50 constables in the last 18 months, and allowing for transfers, leave, still under treatment, etc., 30 men have had a full course of novoarsenobillon and mercury and have had their blood examined twice, sometimes three times, at the serological laboratory after conclusion of treatment.

My standard course of treatment has been six injections of novoarsenobillon (two each .45, .6, .9 gram), or six of Galyl .3 gram, followed by four to six weeks of inunction with mercurial ointment, six weeks' rest, then a blood examination. *Yet with all this treatment, 75 per cent. of the cases are no better serologically than they were at the beginning of the course.*

Clinically, the improvement is enormous; rashes disappear, aches and pains (chronic rheumatism?) vanish, secondary stigmata clear up, and the patients put on weight. Particularly is this the case in nervous and myelitis cases; in these, very marked improvement occurs. Curiously enough, the use of autogenous arsenicalised serum seems to rapidly render the cerebro-spinal fluid free from treponemata in syphilis of the nervous

system; very much more quickly than vigorous treatment will do the same for the blood stream.

It will be admitted, I think, that the above results are disconcerting and necessitate a considerable revision of our treatment, particularly when dealing with patients in private practice. One of the first and most persistent questions of the private patient is "Will these injections be an absolute cure?" and there is considerable disappointment when a decided answer cannot be given. One man came to me last week saying, "Dr. X says he cures syphilis with one injection of '9 gram novoarsenobillon." The patient's appearance and blood reaction were sufficient commentary on the accuracy of this statement. I give brief histories of cases. I have eliminated those who, for some reason, did not complete the course, and have attempted to place the nervous cases together; the cases are given without selection and in the order of their occurrence:—

Case I.—M. G. Constable. Old infection, but denied syphilis. Extensive skin lesions. Wt. 120 lb. W. R. very strongly positive. (10-12-17.) Colloidal sulphur and mercury seven injections; novoarsenobillon '45 eleven injections, two injections mercurial cream, March 1918. Then inunction one month. Novoarsenobillon '9 three injections, May 1918. Mercurial inunction one month. W. R. (17-8-18) very strongly positive. W. R. (15-11-18) very strongly positive, health much improved, skin quite clear. Wt. 132 lb. W. R. (23-5-19) very strongly positive.

Case II.—R. S. Constable. Recent infection gonorrhoea (?) then secondary symptoms, rash, etc. W. R. not done. N. A. '45 six injections. W. R. (17-8-18) very strongly positive. Hg. inunction one month. W. R. (31-10-18) slightly positive. General health much improved. All symptoms disappeared. Weight increased 4 lb.

Case III.—N. N. C. Constable. Infection five months ago. Gonorrhoea, then syphilis. Wt. 104 lb. W. R. (4-1-18) very strongly positive. N. A. '45 six injections. Hg. inunction 15 days. W. R. (27-1-19) very strongly positive. General health much improved. Slight pains in joints. Wt. 115 lb. W. R. (3-5-19) very strongly positive.

Case IV.—A. N. Constable. Wt. 100 lb. Recent infection. W. R. (15-1-18) very strongly positive. N. A. '45, five injections; '9, one injection. Hg. inunction six weeks. W. R. (27-1-19.) Absolutely negative. Wt. 117 lb. Provocative injection '45. N. A. (20-6-19.) General condition much improved. Says, has absolutely no complaint now. W. R. (27-6-19) absolutely negative.

Case V.—R. S. Constable. Recent infection, three months. W. R. (18-1-18) very strongly positive. Extensive skin eruption and joint pains. Wt. 108 lb. N. A. '45, six injections.

Hg. inunction two months. W. R. (5-12-18) very strongly positive.

Case VI.—B. D. D. Head Constable. 108 lb. New infection. Chancre six weeks ago. W. R. (18-4-18) very strongly positive. N. A. '45, six injections. Hg. inunction two months. All symptoms disappeared. W. R. (17-8-18) moderately positive. W. R. (21-12-18) very strongly positive. W. R. (22-5-19) very strongly positive. Still has pains in his joints. Wt. 112 lb.

Case VII.—A. R. Constable. Wt. 125 lb. New infection, chancre, pain in knee joints. Had some mercurial treatment as an out-patient. W. R. (12-4-18) very strongly positive. N. A. '45, four injections; N. A. '9, two injections. Hg. inunction two months. W. R. (1-8-18) very strongly positive. Much better. Can walk. Wt. 132 lb. W. R. (3-10-18) moderately positive. W. R. (22-5-19) very strongly positive. Still complains of pain in joints.

Case VIII.—R. B. S. Constable. Old case. Infected two years. Wt. 100 lb. W. R. (18-4-18) very strongly positive. N. A. '45, two injections; '9, four injections. Hg. inunction one month. W. R. (10-1-19) negative. W. R. (22-5-19) very strongly positive. Wt. 106 lb. Present state—still complains of joint-pain, and occasional numbness in fingers.

Case IX.—G. S. Constable. Recent case—infection one month. Wt. 132 lb. Chancre and indurated glands. W. R. (16-5-18) very strongly positive. N. A. '45, three injections; '9, six injections. Hg. inunction two weeks. W. R. (16-1-19) absolutely negative. Present condition—no joint-pain now. General condition—improved.

Case X.—E. A. Constable. Old infection three years. Wt. 98 lb., chancre. Kaviraji treatment, then profuse secondaries. Numbness in lower limbs. Giddiness, frequent micturition. Loss of weight. W. R. (16-5-18) very strongly positive. N. A. '9, four injections; '45, three injections. Hg. inunction one month. W. R. (22-5-19) very strongly positive. Present state—wt. 93 lb.; no numbness in lower limbs at present. Says he is better.

Case XI.—P. S. Constable. New case: one month; chancre and scaly eruption. Wt. 110 lb. W. R. (16-5-18) doubtful. N. A. '9, three injections; '45, three injections. Hg. inunction six weeks. W. R. (2-1-19) negative. Present weight 116 lb.

Case XII.—R. B. Constable. Admitted 9-3-18. New case. Infection one month. Septic sores and buboes, secondary eruption. Wt. 114 lb. W. R. (17-4-18) negative. N. A. '45, two injections; '9, four injections. Hg. inunction one month. W. R. (31-10-18) negative. (? Wrong diagnosis.)

THE INDIAN MEDICAL GAZETTE.

(20-6-19) Wt. 127 lb. Now complains of Gonorrhœa. Provocative injection '45 N. A. W. R. (27-6-19) negative.

Case XIII.—R. P. Constable. Old case. Infection one year. Chancre and gonorrhœa. Knee joints swollen and painful. Wt. 114 lb. W. R. (22-6-18) very strongly positive. N. A. '6, two injections; N. A. '9, four injections. Hg. inunction one week. W. R. (23-11-18) slightly positive. Wt. 119 lb.

Case XIV.—M. P. Constable. Old case. Infection three years. Wt. 118 lb. No present symptoms. No previous treatment. W. R. (22-6-18) very strongly positive; N. A. '6, two injections; N. A. '9, four injections. Hg. inunction two weeks, then had diarrhœa. 23-8-18 again admitted for catarrh (? influenza). 30-8-18 attacked with acute dermatitis all over body. Skin peeling from hands and feet. Knee-jerk present. Slowly recovered and discharged on 28-9-18. Wt. 128 lb. W. R. (15-11-18) slightly positive. On 19-6-19 says he is well, except for pain in the chest and a number of light brown spots (non-anæsthetic) on the body. Provocative injection '45 N. A. on 20-6-19. W. R. (27-6-19) very slightly positive.

Case XV.—L. M. K. Constable. New case. Infection one month. A nearly healed chancre; no previous treatment. W. R. (22-6-18) very strongly positive. N. A. '6, four injections; N. A. '9, two injections. Mercurial inunction one month. W. R. (23-11-18) absolutely negative. On 20-6-19 appears quite well. Provocative injection '45 N. A. W. R. (27-6-19) absolutely negative.

Case XVI.—A. K. Constable. Recent case. Three months. W. R. (5-7-18) very strongly positive. Chancre healed; no treatment. Enlarged and tender inguinal glands. N. A. '45, one injection; N. A. '6, four injections; N. A. '9, one injection. Hg. inunction one month. Glands subsided. Gained 8 lb. in weight. W. R. (3-5-19) very slightly positive with cholesterolised antigen. Present condition—no complaint. 20-6-1919, looks and feels quite well. Provocative injection N. A. '45. W. R. (27-6-19) absolutely negative.

Case XVII.—M. S. Constable. Old case. Infection over a year ago; no treatment. Has iritis left eye. W. R. (6-9-1918) very strongly positive. N. A. '6, six injections. Hg. inunction three weeks. Iritis disappeared. W. R. (27-1-19) very strongly positive. W. R. (25-5-19) strongly positive.

Case XVIII.—S. N. P. Constable. New infection. One month ago. Chancre three weeks later. Suppurating inguinal gland. No secondaries. W. R. (24-9-18) very strongly positive. N. A. '6, four injections; N. A. '45, one injection. Hg. inunction six weeks. W. R. (27-1-19)

absolutely negative. Provocative injection '45 N. A. (7-7-19.) W. R. (12-7-19) positive.

Case XIX.—B. D. R. Constable. New case. One and half months' infection, healing chancre. Rash appeared a week ago. Wt. 96 lb. W. R. (25-10-18) very strongly positive. N. A. '45, one injection; N. A. '6, two injections; N. A. '9, three injections. Hg. inunction six weeks. W. R. (22-5-19) doubtful. Gained 12 lb. in weight. General health much improved.

Case XX.—G. S. Constable. Old case. Infection twelve months ago. History indefinite. W. R. (23-11-18) very strongly positive. N. A. '45, four injections; N. A. '9, one injection. Hg. inunction six weeks. W. R. (22-5-19) very strongly positive. Very little improvement. Still complains of weakness and of joint pains, especially in the back.

Case XXI.—S. C. A. Constable. Old case. Infection fifteen years. W. R. (14-12-18) very strongly positive. History—five dead children, all of whom had eruption. No regular treatment. Galyl '3 grm., six injections. Hg. inunction six weeks. W. R. (22-5-19) very strongly positive. General condition much better. Gained 4 lb. weight. Vague pains disappeared.

Case XXII.—S. R. S. Constable. Old case, eight months. W. R. (7-12-18) very strongly positive. Slight treatment outside. Some hoarseness and alopecia, dimness of vision in right eye. In poor general health. Ophthalmoscope; slight optic neuritis. Inner side of disc indistinct, due to exudate. Galyl '3, six injections. Hg. 6 weeks' inunction. (10-2-19) eye condition cleared; no neuritis visible. Sight normal. Some dermatitis both arms. General condition much better. Gained 13 lb. W. R. (22-5-19) very strongly positive.

Case XXIII.—D. S. * * * * * Old case, eight years' infection. One healthy child, vague history of several venereal infections during the last 15 years. Has septic sores at present and pains in the joints. W. R. (12-12-18) very strongly positive. Galyl '3, six injections. Hg. inunction six weeks. W. R. (22-5-19) absolutely negative. General condition not improved. Still complains of joint-pains. Has eruption on body and especially in palms of hands.

Case XXIV.—A. G. K. Constable. New case. Infection one and half months ago. Ulcer on penis. Swelling right side, which subsided. W. R. (2-1-19) very strongly positive. Galyl '3, six injections. Hg. inunction 6 weeks. W. R. (22-5-19) strongly positive. General condition much improved. Feels quite well. Gained 13 lb. in weight.

Case XXV.—B. R. Constable. Fresh infection, two months' chancre. Local treatment at Khargapur. Bubo incision. W. R. (2-1-19) very

strongly positive. Galyl '3, six injections. Hg. inunction 6 weeks. General condition much improved. Gained weight 6 lb. W. R. (25-5-19) very strongly positive.

Case XXVI.—A European. Old case. W. R. (16-1-18) in London very strongly positive. C. S. fluid very strongly positive and faint globulin. Dizziness, facial paralysis, speech impaired, and weakness of left arm and leg. Treatment, N. A. '6, one injection; N. A. '9, six injections; blood and C. S. fluid still strongly positive at end of the course. Then mercury in solution by mouth, all in England. June 1918, all obvious nervous symptoms disappeared. Very slight facial paralysis, slight bladder trouble; otherwise in good health. N. A. '9, three injections, November–December. N. A. '9 three injections. Hg. grey oil one c.c. three injections. March 1919, N. A. '9, three injections. Hg. grey oil, one c.c. three injections. W. R. (April) slightly positive. June 1st, '9, N. A. provocative. W. R. (6-6-19) strongly positive; patient feels well, is able to carry on an important business, and often says he never felt better in his life.

Case XXVII.—W. European. Old infection, twelve years ago. Treated and supposed cured; four years ago dizziness, slight fever, some difficulty in walking, especially up steps. Eventually diagnosed. W. R. and C. S. fluid positive in London. Treatment with original 606 in London 3 or 4 doses. In India extensive treatment over three years with N. A. '45, '6 and '9 (over 24 injections) and Galyl. Many injections of mercurial grey oil, until blood W. R. absolutely negative. Five injections of own arsenicalised serum and one of Mulford mercurialised serum into sub-arachnoid space. C. S. fluid (28-2-19) positive, a trace; after three more intrathecal injections C. S. fluid (June 1919) absolutely negative. Patient is physically well. Plays golf, etc., and manages a large business.

Case XXVIII.—S. C. N. Pleader's Clerk. Infection three years. Kaviraji treatment. In a state of paraplegia. No power or sensation in lower limbs. No control over bladder and rectum. Knee-jerks exaggerated. In a wretched physical condition. W. R. (12-2-18) very strongly positive. N. A. '45, five injections; N. A. '9, five injections. Considerable improvement. Return of sensation in limbs. Slight return of power. Bladder control regained. Improvement in general health. Thirteen injections of serum given intrathecally; ten of these were the patient's own arsenicalised serum, three were mercurialised horse serum. The W. R. of the C. S. fluid varied: (24-2-18) very strongly positive; (7-4-18) moderately positive; (9-7-18) very strongly positive; (2-8-18) absolutely negative; (25-10-18) serologist (a) very slightly positive; serologist

(b) very slightly positive; (7-1-19) serologist (a) very slightly positive; (cholesterin) serologist (b) absolutely negative.

Patient much improved; has regained complete sensation and control of bladder. Can walk with a stick and get up from the ground. Partial control of rectum, but still has occasional accidents.

Case XXIX.—R. D. Peon. Carried into hospital with myelitis. Infection seven years ago. Complete loss of movement and sensation of lower limbs, loss of control over bladder and rectum. After second intrathecal injection was able to stand and walk a little with stick. W. R. (12-2-17) 100 per cent. positive. Two more intrathecal injections. Power of limbs returned. W. R. (17-4-17) negative. On 11-5-17 was discharged from hospital apparently cured, with complete control of bladder and rectum. He came back to hospital on 26-6-18 for "debility," which was found to be tuberculosis. He said that for the last year he had been a Sadhu and had wandered all round India. He had no symptoms of myelitis and eventually died of tuberculosis. W. R. (1-9-19) absolutely negative.

Case XXX.—N. K. Constable. Old case; seven years' chancre, no treatment. W. R. (3-7-18) very strongly positive. Paralysis left side; cannot walk. Has to be lifted on to the table. N. A. '45, one injection; N. A. '6, four injections; N. A. '9, one injection. Mercurial inunction one month. Steady improvement under treatment. Could walk and get on to the table after second injection. Apparently quite cured after six injections. W. R. (21-12-18) very strongly positive. W. R. (22-5-19) very strongly positive.

Present condition, 25th June, 1919: says he is quite well, can handle his rifle, and perform all his duties as a constable. Is very pleased with his treatment.

It is hardly worth while to tabulate these cases again, but, put briefly, we may say that of the 28 definite cases detailed above, only five have been cured, or even markedly improved, so far as their blood reaction shows, and two of these were under very strenuous treatment for a very long time. The vast bulk of the cases, though they have improved much in general health, show little improvements in their Wassermann reaction. The treatment is quite as thorough as one is likely to get the ordinary patient to put up with, and is the one generally recommended. Many authorities insist that the mercurial treatment should be kept strictly apart from the arsenical treatment, and this is particularly so in nervous cases. Harrison (who is responsible for the venereal treatment in the army) favours seven arsenical injections in the first 57 days combined with eight injections of intramuscular mercury. This, after an interval of four weeks,

is succeeded by a follow-up course of four intravenous injections of N. A. '6, combined with mercurial injections. (Also see Skinner's paper "Venereal Clinic," *B. M. Journal*, May 24, 1919.)

So far as mercury is concerned, Harrison thinks that, opinion as to the relative value of inunction and injection are equally divided, but "inunctions to be effective, require skilled and conscientious application."

Be that as it may, my present series of cases are receiving inunction on four days out of the seven intervening between each arsenical injection. The men sit round in a ring and rub one another's backs; they have come to take an intelligent interest in their blood reports, and come up regularly to enquire the result of the latest Wassermann test!

THE TECHNIQUE OF INTRATHECAL INJECTIONS.

The method I practise is as follows: The patient is given an intravenous injection of N. A. usually '9 gram. Three-quarters of an hour later, three ounces of blood are removed from the other arm and received into a sterile glass. This is carefully covered and put into the refrigerator overnight. The next day some 30 c.c. of clear serum will have separated. A lumbar puncture is performed, 20-30 c.c. of cerebrospinal fluid *slowly* run off, and the 25 c.c. of clear serum either run in or injected very slowly. The patient is put to bed with the head slightly raised and allowed to go home in the evening. There may be slight headache and a little fever, but, generally speaking, there is very little constitutional disturbance, the patient being able to go to office the next day but one.

SOME POINTS OF PRACTICAL IMPORTANCE IN THE OPERATION OF SCLERO- CORNEAL TREPHINING BY ELLIOT'S METHOD.

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CHRONIC glaucoma is so common in India that any points in its treatment have a special interest for surgeons in India. I do not intend in this article to discuss the merits of trephining *versus* iridectomy or other operations. Every practical surgeon however knows that iridectomy for glaucoma often fails in chronic cases. I have had experience not only of my own cases but of those of many other surgeons of repute in India.

Every ophthalmic surgeon must therefore of necessity resort to a sclerotomy at some time

or other. A careful study of the literature on the subject points, I think, clearly to Elliot's method as the best at present available.

Most operators of experience after doing a large number of any particular operation, find out by experience some practical points which render the operation in their hands easier and safer.

My object in this article is not to criticise the general technique of the operation as described by Elliot, but to give my personal experience of some minor points in its technique, in the hope that some of them at least may be of use to others.

I may add here that in spite of what has been written against this operation, my experience of it during the last five years has been extremely satisfactory. I cannot therefore help thinking that some at least of the bad results reported are due to errors in technique.

1. *Raising the flap.*—It will be generally conceded that the less the hæmorrhage which occurs during this procedure the better.

My incision is exactly that described by Elliot in extent. I find, however, if, when making it, I at first make an incision about one-third of an inch in length in the mid-line, and then insert the points of the closed scissors under the conjunctiva, it is extremely easy to undermine the conjunctiva to the extent required for the *superficial* portion of the flap, and that as a rule no bleeding occurs. This takes only a few seconds. Then a couple of horizontal cuts are made and the whole of the *superficial* portion of the flap is raised. If the beginner after thus defining the flap is afraid of cutting too deep in these horizontal cuts, a strabismus hook may be inserted under the lower edge of the flap and the flap raised. The lower blade of the scissors can then be inserted beneath the flap thus raised and the incision easily made with accuracy. Great care should be taken not to separate the conjunctiva *alone* for the last few millimetres above the limbus, above and including the area where it is purposed to apply the trephine. A few snips with the points of the scissors will divide the subjacent tissues and lay bare the sclera. I am of the opinion that if more care were taken to raise all the tissues over the region of the trephine hole *in one layer*, we should hear less of late infections after trephining. I have tried both a flat needle and the points of the scissors for raising this thicker portion of the flap and splitting the cornea. I prefer the latter as I find one is less liable to wound a scleral vessel with consequent bleeding. It is true this ceases if the operator applies a little adrenalin and waits a little while, but it is well to avoid it.

2. *How to make sure of getting sharp trephines in India.*—I have tried various methods.

I had a special air-tight drum with a rack for the trephines, made for me by Messrs. Down Bros. It was filled with a mixture of lysol and spirit as recommended by their representative in India. I found however that the cutting edge deteriorated. I have tried coating the trephines with anhydrous paraffin. It proved unsatisfactory. Even if kept unopened for any length of time in the changeable climate of the United Provinces, the edge deteriorates.

I have found it most satisfactory to place an order with the makers in England to send me out a certain number of trephines monthly. They are packed separately and only opened at the time of use.

A word of caution may be given here.—Always see that the blade fits the trephine handle before sterilising it, as I have found occasionally a mistake has been made and a trephine blade sent out that did not fit the handle made by the same maker for the size ordered. If this had been discovered in the course of the operation serious inconvenience might have been caused. After the operation the trephine is washed and dried by placing it on a hot metal plate, and then wrapped up in the paper in which it was received from the makers.

3. *Size of trephine.*—My preference is for a trephine of one and a half millimetres in diameter. If care is taken to split the cornea as Elliot advises, I very seldom find any trouble due to the iris getting entangled in the trephine hole. If there should be, I usually free it by passing a special, slightly curved, grooved iris repositor. I have always an irrigator to hand if required but very seldom use it, for reasons explained later.

Extreme inconvenience may be caused by a big filtering scar due to a large trephine hole. I have seen a patient operated on elsewhere whose life was rendered very miserable, and her power of earning a living much diminished by the continual lachrymation, and irritation caused by a huge filtering scar. Such cases must, I think, be more liable to conjunctivitis, especially in North India, where the dust and glare try even normal eyes. In such cases the danger of infection passing through the layer of conjunctiva covering the trephine hole, and causing panophthalmitis, the great and well-known danger in eyes that have been trephined, must be greater than in eyes where a moderate-sized trephine hole has been made.

I have many cases under observation in well educated Europeans, sensitive English and Indian ladies, in which the tension, proved by the tonometer, has kept normal for years, who are scarcely conscious of any difference in the feeling of the eye after trephining.

This is an extremely important point from the patient's point of view. Elliot and others use a

two-millimeter trephine and cut away more or less of the disc, according to the nature of the case. This has its advantages, but it weakens the sclera more than a smaller trephine, and my preference is for the smaller one.

4. *How to use a trephine that is not perfectly sharp.*—During the war I had occasionally to use a trephine that was not perfectly sharp, as the supply failed. An operator in the East where supplies cannot be obtained locally may, occasionally, have to use such a trephine.

Any one who has worked at carpentry knows that in sawing a piece of wood, the saw cuts much better if the wood is held perfectly steady. The same applies to the trephine. I found that, if in addition to the assistant fixing the eyeball by means of a fixation forceps applied below the centre of the cornea, I also fixed the globe by means of a pair of fixation forceps applied at the outer edge of the sclera exposed in the flap, lateral movement was prevented and the trephine cut surprisingly better. Anyone may try the truth of this statement for himself. I, unfortunately, owing to the lack of sharp trephines, have had to resort to it several times. To me it was a very valuable discovery.

5. *Fixation of the eyeball during the operation.*—In every case after telling the patient to look down, I get an assistant to steady the eyeball by grasping the conjunctiva with a fixation forceps close to the limbus, below the centre of the cornea. Most of my patients have so little self-control that it would be dangerous to operate without doing this.

Elliot in his book on glaucoma, page 469, states as an argument against the performance of iridectomy as follows: "*In the event of a sudden movement on the part of the patient we may get iris tissue impacted in the wound.*" By this procedure, in my experience, and in addition, in the case of a very nervous patient, by getting a third person to steady the head, it is possible to control perfectly even a very nervous patient. Such patients are very common in my practice.

6. *The iridectomy.*—Elliot advises that the scleral disc should be left undivided at one edge, and that in doing the iridectomy, both it and the iris should be grasped by the iris forceps and cut by the scissors at the same time. He states, quite rightly, the reason for this is that it prevents a troublesome patient from rolling the eye and dragging the iris into the wound. If however the eyeball is fixed by an assistant as described above, I find the patient practically never rolls it enough to give any trouble. I find the iridectomy can be done more neatly by removing the disc first. In grasping the two together I find there is, in my hands at least, a greater tendency to pull the iris into the trephine hole than if the disc is first removed, thus giving a clear view of the iris, the projecting portion of

which can then be excised with the exertion of a minimum of traction.

In very troublesome cases Elliot's method should be followed, but if fixation of the eyeball is used, I think in most cases the method I suggest is preferable.

7. *The danger of leaving blood in the Anterior Chamber. Some suggestions for avoiding it.*—I do not think sufficient attention has been paid to this point in the writings I have seen on the subject. Some writers observe quite rightly "*in most cases it speedily clears up*". But what are the after results if it does not? In some cases the blood appears to be becoming rapidly absorbed, but if the front of the lens be examined with a loupe, a fine deposit of disintegrated hæmoglobin may be seen on the front of the lens. I have seen in the case of a well-educated Englishman the vision reduced from 6/6 before operation to 6/12 after operation. The iridectomy in both cases was of exactly the same size and peripheral. The vision in the other eye was appreciably improved. There was, however, no hæmorrhage in the latter eye. The tension of both eyes has remained normal for over two and a half years since the operation, but after about 4 months from the operation no further improvements took place in the eye in which the hæmorrhage occurred. I have seen similar deposits on the hyaloid membrane in cases of intracapsular extraction of cataract, in which a conjunctival flap has been used. In such cases the vision is often very much reduced indeed.

I find that if after removing the scleral disc and doing an iridectomy, the operator pauses for a little time, the length of which varies in different cases, the bleeding after a time ceases. The flap should then be replaced in position. This suggestion is meant more for beginners than experienced operators, who will probably have found this out by experience. With the former there is a tendency to replace the flap and finish the operation as soon as possible, especially if the patient is nervous and complaining.

A little blood is often seen in the region of the cut iris. It is a little tempting to try to massage this out. My experience is that it is a great mistake to attempt this. It can be done often, but in doing it the aqueous is expelled, and if the bleeding has not ceased in the region of the trephine hole, when the cornea resumes its shape it exerts suction, and the whole of the anterior chamber may be filled with blood. I have seen this happen. My experience is, that in cases in which a little blood gets into the anterior chamber, in which the aqueous is not expelled, it is usually perfectly absorbed.

If it is required to remove blood from the anterior chamber the irrigator must be used, as advised by Elliot.

Even by this means, as Elliot says, *it is not always possible* to remove it all. Any point therefore which helps in avoiding it is worthy of special attention. Irrigation also, which I shall discuss later, in my opinion is better avoided if possible.

8. *How to remove the scleral disc if it gets into the anterior chamber.*—This accident has occurred to me four times, two of which were in my very early operations and two when I was using blunt trephines. Usually the disc lies near the trephine hole. In three of these cases I found it quite easy to pick it out by means of a Hess iris forceps, the special pattern he uses for peripheral iridectomy. It is a very delicate instrument with a shoulder to it, which makes it well adapted to the purpose. I got it in Munich. I do not know if it is available in England. In the other case a very gentle irrigation served to bring the disc within reach and it was picked out by this forceps quite easily.

Elliot, to whose large experience due deference must be paid, always removes it by means of the irrigator.

9. *The use of irrigation in sclero-corneal trephining.*—It will be gathered from this article that wherever I can, I avoid the use of irrigation. I am quite aware that irrigation is used by many experienced operators both in this operation and in cataract operations. I have no hesitation in using it in cases in which I consider it absolutely necessary. I cannot however think that the introduction of a fluid into the anterior chamber *the composition of which can only be in approximation to the normal aqueous* is a desirable proceeding. Possibly the fact that I have never had any iritis sufficient to cause any trouble, may be due to abstention from irrigation wherever possible though I must admit I always use atropine after every operation.

The introduction of instruments into the eye is not devoid of danger, but if the operator is skilful and in constant practice, no harm should result. I am not aware yet of having caused any damage by so doing.

In certain very hard eyes in which the underlying structures are closely packed against the trephine hole, as described fully by Elliot, extreme caution is necessary in introducing an instrument into the eye lest these structures be damaged. The operator must be on the lookout for such cases.

10. *Choice of an anæsthetic.*—I have found very great advantage from giving an injection of hyoscine and morphia in cases in which I use a local anæsthetic. The majority of my cases are very nervous. They are not well educated as a rule. They have some sight and very much fear they may lose this. Indeed in my hospital practice, I find only about one-third of the patients who have glaucoma submit to operation

if only one eye is affected, sometimes I fear the proportion is even less. This is in spite of the fact that the dangers of delay are carefully explained to them, both by myself and my assistant. They say they have sight and all that they require is a little medicine to make it better.

Patients who have lost one eye from glaucoma submit much more readily to operation. They realise the other is going the same way, and probably have lost their faith in medicine.

These remarks apply of course chiefly to the uneducated, who form the bulk of hospital patients.

There is however even among the educated a tendency not to realise the dangers of glaucoma. This is the case also in Europe. I have seen a surgeon in Europe vainly trying to persuade a patient to submit to immediate operation.

I find that the use of morphia and hyoscine in such cases is an immense advantage. If care is taken not to give them anything to drink till the evening, nausea and vomiting, in my experience, is very uncommon. If it does occur it is usually not serious, and does not occur till about 8 to 10 hours after operation, by which time the flap will have become adherent.

In cases of extremely nervous patients I use chloroform. I would like to mention one point in this connection which I have not seen previously mentioned.

It has been pointed out by Axenfeldt and others that a valuable sign that the trephine has entered the anterior chamber is that the iris moves upwards in the direction of the trephine hole and the pupil becomes pear-shaped. This is due to the rush of aqueous from the anterior chamber carrying the iris with it. It is a valuable indication under local anæsthesia, but in my experience it is quite unreliable if the patient is under chloroform, and if the operator relies on it he is liable to be misled.

A Mirror of Hospital Practice.

AN INTERESTING CASE OF PARENCHYMATOUS NEPHRITIS.

By D. McCAY, M.D., M.B.C.P. (Lond.),

Medical College, Calcutta.

On April 2nd, 1919, Manmatha, a Hindu male of 18 years, was admitted for the treatment of œdema all over the body, duration about three months. He complained of difficulty of breathing, nausea and occasional vomiting. Gave history of fever, six months ago, probably influenza.

On examination we found a typical picture of renal dropsy. The face puffy and pallid. The

hands, chest, back, abdominal wall and legs all swollen and pitting deeply on pressure. His heart dilated with systolic murmurs (hæmic). Œdema of the bases of the lungs and ascites were present. The blood pressure was 92 mm. of mercury. The urine very scanty, about four to six ounces a day, and showed copious albumen and casts on examination. His body weight was 9 stones, 2½ lb.

The lines of treatment we adopted will be better understood from the chart and table published herewith. For the first twenty-four days we treated him on the ordinary lines with all sorts of diuretics and diaphoretics, hot air baths, dry-cupping of kidneys and saline purgatives. All this time we kept him mainly on carbohydrates, restricting the intake of salts and fluids as much as possible. During this period he passed on an average about eight ounces of urine a day and his condition became worse. As the anæmia was increasing daily we had the blood analysed on several occasions, and decided to add more protein to the previous diet. Dr. Charubrata Roy, M.B., B.Sc., Demonstrator of Physiology, very kindly examined several samples of his blood and also estimated the various constituents of his diets. He was given pot. citras in adequate doses to make his urine alkaline and all other medicines were stopped. We could not give this line of treatment a sufficient trial for the condition of the patient became alarming. Not being accustomed to the diet he was put on, he began to vomit badly and his condition became so distressing that we had to stop the protein part of his diet.

About the 42nd day, we got a blood report, which showed a marked diminution of the total nitrogen:—

Total nitrogen	...	...	1.7%
Non-protein nitrogen	...	...	.098%
Urea	...	...	.04%

He was again put on a diet with increasing amounts of protein and, at the same time, we cut down the carbohydrate part of his diet. The pot. citras was stopped and he was placed on a simple saline diuretic with iron, by mouth. To remove the immediate cause of distress and to gain time, we drained his subcutaneous tissue spaces by means of Southey's tubes and removed 23½ pints of fluid. Notwithstanding this, the œdema continued until the patient drained himself through his kidneys. With the change of diet his urine flow gradually increased, till he was passing over 130 ounces a day for several days, and then the quantity came down to about 60 ounces a day, when all of the extra fluid of his body had disappeared. The man was reduced to less than a quarter of his size and showed no œdema anywhere in his body. His weight is 6 stones 10 lb. (15-7-19). The last

examination of his blood showed an increase of the total nitrogen.

20-6-19. { Total nitrogen, 2.03 per cent.
Non-protein nitrogen, 1.75 per cent.
Urea, .0395 per cent.

An examination of the urine of the 16th June showed 0.03 per cent. of albumen, 0.6 per cent. of urea and a specific gravity of 1012. No casts were found.

An examination of a sample of tissue fluid —(removed by Southey's tube) showed—

Total nitrogen, 0.091 per cent.
Coagulable nitrogen, 0.021 per cent.
Non-coagulable nitrogen, 0.07 per cent. } 22-5-19.
Globulin nitrogen, a trace.
Albumin nitrogen, 0.021 per cent.

from the tissue spaces into the capillaries by the backward filtration process; on the other hand, when the osmotic pressure exerted by the colloids of the blood falls below its normal, the fluid from the capillaries passes into the tissue spaces. In normal conditions an equilibrium is maintained between these two processes. In chronic parenchymatous nephritis, as has been pointed out by Epstein, the protein of the blood is very much reduced, hence the osmotic tension falls and fluid passes out into the tissue spaces, and will be retained there unless and until the blood recovers its protein element. In one case, the total nitrogen was 1.7 per cent., which is far below the normal. Hence

Days in hospital.	Dates.	Diet.	Medical and other measures.	Quantity of urine.	REMARKS.
1st to 13th day.	2-4-19 to 14-4-19	Bread ... Protein, 56 grm. Sago ... Fat, 32 grm. Sugar ... Carbohyd., 315 grm. Milk ... Energy value, 1754 calories.	1. Saline diuretics and diaphoretics. 2. Saline purgatives. 3. Caffeine sodæ salicylate. 4. Theocine sodium acetate. 5. Dry-cupping of kidneys.	Average daily about eight ounces.	Anasarca, œdema of the lungs and ascites all increasing.
14th to 18th day.	15-4-19 to 19-4-19	Rice ... Protein, 54 grm. Bread ... Fat, 24 grm. Milk ... Carbohyd., 349 grm. Sugar ... Energy value, 1828 calories.	1. Salines. 2. Caffeine citrate. 3. Hot-air baths. 4. Dry-cupplings.	Same	Condition worse.
19th to 33rd day.	20-4-19 to 4-5-19	Fish ... Protein, 105 grm. Mutton ... Fat, 785 grm. Rice ... Carbohyd., 222 grm. Bread ... Energy value, 2254 calories. Milk ... Green vegetables.	1. Caffeine citrate. 2. Digitalis. 3. Pot. citrates. 4. Pot. iodide. 5. Saline purgatives.	Average, about 15 ounces a day.	Condition became very bad—began to vomit and dyspnœa was very severe.
34th to 41st day.	5-5-19 to 12-5-19	Bread ... Protein, 56 grm. Sago ... Fat, 32 grm. Milk ... Carbohyd., 315 grm. Barley ... Energy value, 1772 calories. Sugar ...	1. Oxygen inhalation. 2. Southey's drainage tubes into the subcutaneous tissues of the legs. 3. Saline purgatives. A simple saline diuretic with iron.	Average, about 25 ounces a day.	280 pints of fluid were drained through Southey's tubes. Condition slightly better.
42nd to 45th day.	13-5-19 to 16-5-19	Mutton ... Protein, 109 grm. Fish ... Fat, 38 grm. Rice ... Carbohyd., 339 grm. Milk ... Energy value, 2314 calories. Sugar ... Ghee ...		About 12 ounces a day.	œdema present. No further improvement.
46th to 57th day.	17-5-19 to 27-5-19	Mutton ... Protein, 122 grm. Fish ... Fat, 87 grm. Rice ... Carbohyd., 132 grm. Milk ... Energy value, 1799 calories. Ghee and salts.	Ditto.	Daily increasing—passed 52 ounces on the last day of this period.	œdema better. General condition improving.
58th to 83rd day.	28-5-19 to 23-6-19	Chicken ... Protein, 160 grm. Rice ... Fat, 83 grm. Fish ... Carbohyd., 132 grm. Milk ... Ghee and salt.	Ditto.	Daily increased till he passed 134 ounces a day for 4 days and then came down to an average of about 80 ounces a day.	No œdema anywhere. Patient is very much reduced, looks only skin and bone but is feeling very much better.

To explain the reason of our success in this case with high protein diet, we must explain the cause of œdema in chronic parenchymatous nephritis. In health the fluid of the blood is replaced by the fluid in the tissue spaces according to two views, viz., the backward filtration theory of Landuer and the osmotic theory of Starling. When the pressure in the capillaries falls below that in the tissue spaces, the fluid passes

the rational treatment would be to increase the protein of the blood, which is safely done by increasing the protein of the diet. The carbohydrate portion of the diet should be reduced, because one of the main products of its metabolism is water. In the above case we could not reduce the carbohydrate to less than 132 grammes per day because the man was brought up mainly on carbohydrate food and was very

much upset when this element was reduced. The protein was increased up to 165 grammes per day and this raised the total nitrogen of his blood to 2.03 per cent., which was quite enough to turn the scale in his favour and maintain the equilibrium between the blood fluid and the fluid in the tissue spaces. The patient now takes from 40 to 50 ounces of water a day, and passes the whole quantity out with his urine, whereas before, almost every drop of fluid he took used to pass out into the tissue spaces and collect there; and no measures—medicinal or otherwise—could make that water pass out of his body.

The patient continued to improve in his general health; he rapidly gained strength and colour. The anæmia has practically disappeared and there are practically no signs of œdema. The urine has also continued to improve, the albuminuria at the present time—15-7-19—having become reduced to a mere trace.

ON THE LATEST METHOD OF TREATMENT OF CHOLERA.

By M. P. CHACKO, L.M.S.,

[Lately on special Cholera Duty, Trivandrum,]

Peermade, Travancore.

In the following pages I do not claim any attempt at originality. It is simply a record of cases treated by the intravenous injection of hypertonic saline as suggested by Sir Leonard Rogers. Lives have been saved when all other methods of resuscitation have failed. In many cases the effect has been immediate and striking. I have seen patients who were on the brink of death brought back to life in a most astonishing way, and the method requires to be used much more widely than it is at present. At the same time I do not suggest its indiscriminate use.

My results are vitiated by a variety of circumstances. Owing to difficult conditions obtaining in general practice outside the hospital, it was not possible to carry out the directions of the author of this method *in toto*. It was a practical impossibility to carry out those instructions during midnight hours, amidst uncongenial conditions. Many cases were seen *in extremis*, and injection was resorted to as a last resource without any confidence in the ultimate success.

Indications.—In such a rapidly fatal disease as cholera the main indication is to support the strength and maintain the blood pressure; and this can be readily accomplished by the intravenous injection of saline.

As the result of my present experience, I believe that when the blood pressure falls below 70 per mm., saline infusion is imperatively indicated, as this is an indication that the blood pressure is rapidly going down and requires to be reinforced. If the blood pressure is between 70 and 80 the

case is still dangerous, and transfusion of fluid ought to be performed. With a blood pressure between 80 and 90 the indications are less clear, but there can be no doubt that a blood pressure so low is attended with dangerous consequences. In a patient therefore with this range of blood pressure or under, saline infusion ought to be performed.

Transfusion with hypertonic saline accomplishes something more than reinforcing the blood pressure. The introduction of calcium chloride arrests the tendency to oozing from the capillaries and arterioles of the intestinal tract, and indirectly aids in arresting the frequent evacuations. I think that even when the blood pressure is above 90 or over, improvements in the condition of patients may still be expected from infusion.

Determination of the amount of fluid to be given.—The symptoms in the recipient that call for cessation of transfusion are rigors, frontal headache, precordial pain, high blood pressure, and failure to raise the blood pressure though fluid is ascertained to be flowing into the vein. These symptoms have been observed in only ten of my cases. I have never noticed injurious distension of the heart from the increased volume of fluid in any of my patients. On an average two to three pints may be injected into an adult without producing any symptoms.

Conclusions.—1. Transfusion of hypertonic saline is a procedure simple, safe, and of extreme value in certain cases, though the results, about to be mentioned, do not look very striking on paper. It will be seen this is due to the fact that many of the cases were desperate, and that I have not considered statistics in the endeavour to give the method a trial even in the most hopeless cases.

2. The benefits of saline transfusion will vary with the class of case and the continued attention one is able to give the patient at the bed-side.

(a) In a patient whose pulse can be felt at the wrist and whose evacuations have ceased, the effects are likely to be immediate, striking and permanent.

(b) In a patient who is dying, whose pulse cannot be felt at the wrist, whose voice is hoarse, whose limbs are rigid, whose evacuations continue even after the injection, the results are far from satisfactory.

(c) In a patient whose pulse rate does not diminish in frequency, whose blood pressure does not improve after the injection, the results are not satisfactory.

(d) Nevertheless I concur with Doctor Cox, of Shanghai, that, if saline infusion can be given repeatedly and continuously, some of the cases, that would otherwise die, may be saved.

SHORT SUMMARY OF CASES.

1. L. 22. M.—Got the attack at 3 P.M. Vomiting and purging incessant, watery stools with flakes of

lymph, restless, profuse perspiration. Saw patient at 1 A.M.; pulse scarcely perceptible, eyes sunken, saline infusion 2 pints, a profuse watery motion after the injection, pulse failed, attempted to infuse in the other arm, patient restless and unwilling for the operation. Died at 6 A.M.

2. J. 45. W.—Attacked at 3 P.M. Vomiting and purging frequent, potassium permanganate pill given every 15 minutes, saw patient 8 P.M.; voice hoarse, pulse fair, $\frac{1}{10}$ gr. morphia with $\frac{1}{100}$ gr. atropin was injected. No motion for three hours, patient slept, frequent motions began later. Died at 5 A.M.

3. P. 28. M.—Commenced at 1 A.M. Saw patient at 4 P.M. Pulse could not be felt at the wrist, frequent watery evacuations, profuse perspiration, restless, saline injection 2 pints, profuse watery motions after injection in continued succession, rigors. Died.

4. N. 40. M.—Motions and vomiting stopped, patient restless, sleepless, suppression of urine, intense thirst, pulse hardly perceptible, saline infusion three pints. Recovered.

5. M. 9. C.—Commenced at 1 A.M. Saw patient at 9 A.M.; restless, pulse *nil* at the wrist, eyes sunken, body cold, clammy and rigid, about to stop breathing just before the introduction of cannula, infusion 1 pint, breathing commenced, but motions after injection. Died at 2 P.M.

6. V. 45. M.—Saw patient at 8 A.M. Pulse over 70 mm., but below 80 mm., suppression of urine, restless, motions not frequent, small in quantity, thirsty, infusion 2 pints, rigors. Recovered.

7. S. 16. M.—Saw patient at 8 P.M. Motions diminished in frequency, restless, suppression of urine, pain in the abdomen (intestinal cramps), pulse scarcely perceptible, eyes not very sunken, infusion $1\frac{1}{2}$ pints. Recovered.

8. K. 28. M.—Began at 1 A.M. Saw patient at 6 A.M. Motions and vomiting not frequent. Pulse above 80 mm. but below 90, suppression of urine, infusion 2 pints, rigors. Recovered.

9. K. 35. M.—Saw patient at 7 P.M., restless, motions diminished in frequency, vomiting incessant, pulse hardly perceptible, suppression of urine, infusion 2 pints, $\frac{1}{100}$ gr. atropin injected. Recovered; vomiting continued for another day.

10. R. 36. M.—Saw patient at 10 P.M., motions and vomiting incessant, pulse *nil* at the wrist, profuse perspiration, cold and clammy, limbs rigid, suppression of urine, infusion 3 pints, broad watery motions after injections. Died.

11. A. 10. C.—Motions less frequent and small in quantity, pulse feeble and thready, eyes sunken, infusion 1 pint, suppression of urine. Died.

12. I. 38. M.—Saw patient at 8 P.M. Pulse almost *nil* at the wrist, limbs rigid and cold, respiration rapid, cramps, motions continue, infusion 2 pints, profuse repeated motions after the injection. Died.

13. M. 28. W.—Saw patient at 7 A.M. Pulse fair, injection morphia c. atropin, motions stopped for four hours, afterwards pulse showed signs of failure, infusion 2 pints, rigors, suppression of urine, after 2 hours pulse failed, infusion under breast 1 pint, no improvement. Died at 5 P.M.

14. V. 40. M.—Saw patient at 3 A.M. Restless, pulse scarcely perceptible, vomiting and motions incessant, infusion 2 pints, rigors, profuse repeated motions after injection, saw again at 7 A.M. Pulse failed, patient drowsy. Died.

15. M. 18. W.—Saw patient at 8 A.M. Pulse feeble, eyes sunken, cold extremities, motions continue, suppression of urine, infusion 3 pints, pulse improved. Pulse again failed after 18 hours, infusion 2 pints, pulse no improvement, motions continue. Died at 11 A.M. next day.

16. R. 22. M.—Pulse scarcely perceptible, eyes sunken, extremities cold, suppression of urine, motions stopped, infusion 2 pints, pulse improved, steady, no motions after injection. Recovered.

17. S. 24. H.—Seen *in extremis*, pulse *nil* at the wrist, cold extremities, eyes sunken, suppression of urine, infusion 3 pints, pulse showed temporary improvement, motions began again. Died.

18. P. 33.—Pulse fair, motions incessant, voice hoarse, eyes sunken, infusion three pints, rigors, pulse improved, motions, after three hours pulse failed, infusion two pints, no improvement. Died.

19. K. 55.—Subject of chronic diarrhoea. Saw at 11 P.M. Pulse fair, motions incessant, typical watery motions, suppression of urine, infusion two pints, pulse improved, motions continued immediately after injection. Died early morning.

20. A. 35. H. H.—Saw patient at 3 P.M. Pulse fair, motions stopped, restless, suppression of urine, cold extremities, infusion three pints, pulse improved, no motions after injection. Recovered.

21. P. 25. H.—Saw at 4 P.M. Pulse fair, motions stopped, suppression of urine, infusion of saline with sodi. bicarb., pulse full, motions not frequent, urine passed. Recovered.

22. R. 15. H. M.—Saw at 5 P.M. Pulse thready, motions not frequent, extremities cold, eyes sunken, suppression of urine, infusion one pint, pulse full, urine passed. Recovered.

23. R. 15. B.—Motions frequent, pulse feeble, suppression of urine, infusion two pints. Recovered.

24. S. 55.—Saw patient at 10 A.M. Patient walking about, pulse full but rapid, apparently in good health, had one motion in ten minutes, profuse watery motion, pot. permang. pills one every quarter-hour, another profuse motion in ten minutes, patient collapsed, profuse perspiration, pulse failed at wrist, infusion three pints, patient restless, motions in bed, rigors, temporary improvement of pulse, watched by bed-side for two hours, pulse showing rapid failure, attempted infusion in other arm but owing to restlessness impossible. Died at 5 P.M.

25. S. 45. M.—Saw at 7 A.M. Pulse feeble, extremities cold, motions frequent, infusion three pints, pulse full, motions continued. Died.

26. P. 18. H.—Watery motions frequent, pulse steady and good, infusion under breast. Recovered.

27. P.—Saw patient at 5 P.M. Pulse *nil* at wrist, extremities cold, suppression of urine, infusion three pints, pulse improved, motions continued. Patient died.

28. K. M. 25.—Saw patient at 7-30 P.M. Pulse thready, motions ceased, suppression of urine, restless, intravenous injection two pints. Recovered.

29. G. 14. M. Saw patient at 7-30 P.M. Evacuations ceased, pulse thready, restless, suppression of urine, intravenous injection two pints. Recovered.

30. P. 18. W.—Motions continue, pulse fair, infusion under breast two pints, suppression of urine. Recovered.

In the foregoing cases I have tried to give a succinct statement of each and the result of the treatment. I may state that more than fifty cases were treated by this method but only representative cases are given here. It will be seen that the success of the method in my hands was barely fifty per cent. I am not unaware of the drawbacks I work under. Still the results are sufficiently encouraging to induce others better equipped to try the saline method in saving life. I may also state that permanganate, atropin, and other methods of treatment were tried in almost all the cases before intravenous infusion was resorted to.

In conclusion I have to thank Doctor Kesava Rao, of the Trivandrum T. I. C., for the valuable help and encouragement he has given me during a trying period. I have to acknowledge my thanks to many others also, whose names are too numerous to mention.

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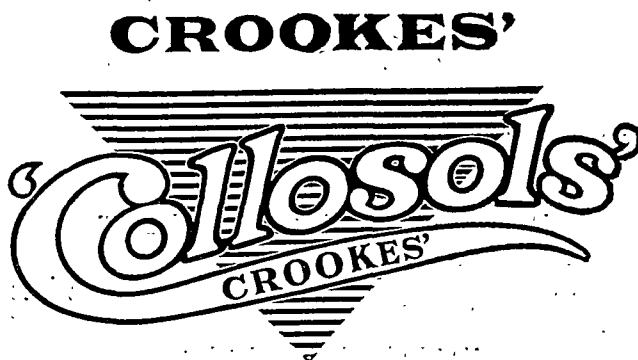
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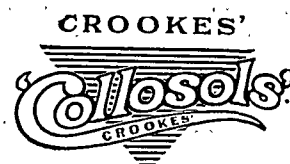
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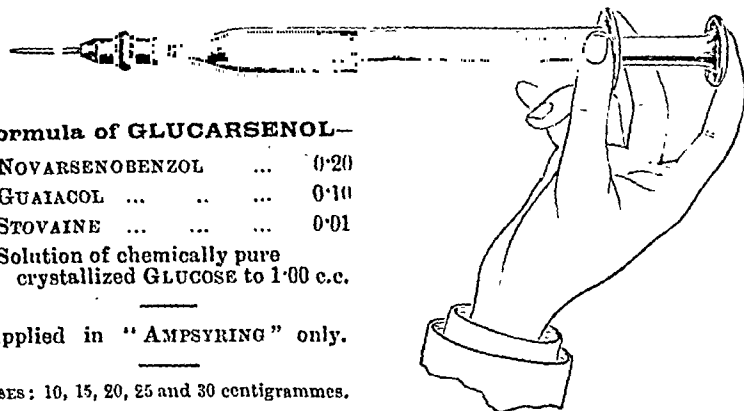
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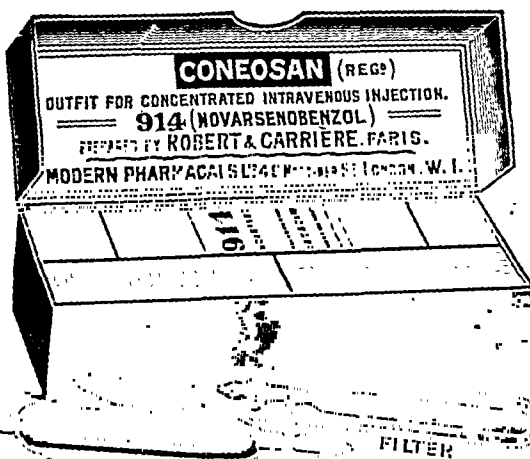
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Indian Medical Gazette

AUGUST.

THE INDIAN MEDICAL SERVICE.*

LONDON DINNER.

THE dinner which the officers of the Indian Medical Service have been accustomed to hold every year in London was intermitted during the war. The custom was resumed on June 11, when Colonel Sir P. J. Freyer, K.C.B., I.M.S. (retd.), was in the chair. The guests were the Right Hon. E. S. Montagu, M.P., Principal Secretary of State for India; Sir Norman Moore, Bt., President of the Royal College of Physicians; Lieut.-General Sir H. V. Cox, K.C.B., Military Secretary, India Office; Dr. James Neal, Deputy Medical Secretary, British Medical Association; Mr. Austin Low; the Editor of the *British Medical Journal*, and a representative of the *Lancet*.

THE CHAIRMAN.

Sir Peter Freyer, after giving the toast of the King, proposed that of the Indian Medical Service. Though many years, he said, had elapsed since his retirement he retained his affection for the Service, and was proud shortly after the outbreak of war to be appointed consulting surgeon to the Indian hospitals at Brighton, where he was again enabled to work with his brother officers for the benefit of wounded sepoys. No episode in the history of the I.M.S. reflected greater credit upon it than the satisfactory way in which these hospitals were conducted and the devotion to duty displayed by the medical officers. His pleasure in presiding at the dinner was enhanced by the fact that the chief guest was the Secretary of State for India; never in the history of the annual dinners had there been a guest more welcome and more honoured. Since his advent to power Mr. Montagu had displayed a friendly interest in the Indian Medical Service and had approached the consideration of its grievances with sympathy. He had already redressed some

* We are deeply indebted to the Editor of the *British Medical Journal* for his courtesy and thoughtful kindness in sending an advance copy of the report of the Indian Medical Service Dinner.

Owing to this graceful act we are enabled to publish the B. M. J.'s account of the dinner and speeches in our present issue.

of the most glaring, and had promised to do much more. Mr. Montagu was a man of courage and determination in pushing through reforms, and if he carried into effect those improvements in the Service adumbrated in his public speeches—as no doubt he would—the Indian Medical Service would be replaced in the proud position it formerly held—that of the most popular medical service under the Crown. From that position in recent years it had sadly fallen; in the Service, and in the medical schools and universities which prepared candidates for the medical service of the Crown, a spirit of pessimism had prevailed. The limit of the endurance and patience of the Service and of the medical profession had been reached, but since Mr. Montagu took the matter in hand, pessimism had given way to optimism. The work the I.M.S. had done in and for India since the days of Gabriel Boughton (1638) had been inestimable. Through its influence hospitals had been gradually developed in India, so that at the present time hundreds of large hospitals and thousands of subsidiary hospitals were scattered over the length and breadth of the land. In these hospitals tens of thousands of important surgical operations were performed, so that it was no exaggeration to say that in many of them there were officers of the Indian Medical Service performing annually single-handed more surgical operations than were performed by the whole staff in many of the great London hospitals. During the last seventy-five years, concurrently with the spread of hospitals, medical schools and colleges had been established through the enthusiasm of officers of the Indian Medical Service, from whose ranks the professorial staffs had been mainly drawn. In these schools and colleges thousands of Indian medical men had been educated, becoming keen, well-qualified practical physicians and surgeons, who competed with their former teachers, and the Indian Medical Service generally, for that private practice which was formerly one of the greatest attractions of the Indian Medical Service. Whatever fate the future held in store for that Service, he personally believed it would flourish while the British Raj existed, for it was the system most economical, most efficient, and most suited to the requirements of India both from a civil and a military point of view. In conclusion he gave the toast of "The Indian Medical Service,"

coupling it with the name of Mr. Montagu, who, though the Service had not the honour of numbering him among its members, was yet to be regarded as the physician sent to heal its infirmities.

THE SECRETARY OF STATE.

Mr. Montagu, in the course of a sympathetic reply, said that though strictly speaking he had no right to respond to the toast, he gladly did so because he was convinced that the welfare of India was bound up with the welfare of the Indian Medical Service; that in fact, as he had said on another occasion, the Indian Medical Service was the pivotal service. What were its wants? First of all, if it was to do its great work it must be a contented service. A man who entered and worked in it, must feel assured that his interests were safeguarded, and be able to rely on those whose duty it was to look after his interests and those of his service. He must be assured of adequate pay, and the minimum necessary improvements in pay had been promulgated during the last few months. The next point was that the status of the Service should be satisfactory; to attain this there must be, in the first place, proper access for the representatives of the Service to the Government of India and to the provincial governments, so that authoritative scientific opinion should be directly expressed; and, secondly, the matter of the relative claim to promotion and prestige of the I. M. S. and the R. A. M. C. in India should be so adjusted that an end might be put to a system under which merits and faults were wrongfully attributed. Another point was that the candidate for admission to the Service should feel in a position of security with regard to his prospects of promotion and the opportunities for attainment of experience. This was a primary necessity. There had been talk of curtailment of the right to private practice and of the separation of the civil and military services of India, but the usefulness of the I. M. S. in India depended on opportunity for diversity of experience. No man would be hampered in his private practice so long as it did not interfere with his duties to the Government, a principle which the Indian Medical Service was not likely to forget. Associated with opportunities for practice there must be opportunities for study; there must be study leave to visit on favourable terms the centres

where the most recent achievements of medical science could be witnessed, and this implied a large enough leave reserve. In India itself there were needed first greater opportunities for research, and, secondly, proper equipment for practice. Not long ago he had given to the House of Commons figures of the great influenza epidemic of last year, which had caused six million deaths in India and withdrawn from their daily avocations two-thirds of the population. A problem presented by such events as these could only be investigated in India, in order to ascertain what were the conditions of that country which had, so to say, particularized the infection. Research institutes with their libraries and attached hospitals must be established either by the Government, or by private munificence, or by both means. With regard to practice, he considered that there was ample room for urging greater expenditure on scientific equipment for the station hospitals. When these reforms had been achieved, then the Indian Medical Service would be on the high road to contentment. "I myself," said Mr. Montagu, "am doing my best to bring these things about, for I fully realize that unsatisfied promises cannot produce satisfaction. But the first of scientific virtues is patience. The labours of the committee over which Sir George Makins presided have produced important results, and the report of Sir Verney Lovett's Committee has been received and is under consideration. Things are in train, and I promise you that I will do my best to solve the problems presented to us."

Mr. Montagu, in his temporary capacity as a member of the Indian Medical Service, seemed to express very accurately the aspirations of that Service, for every point he made was punctuated by applause.

THE CHAIRMAN OF THE NAVAL AND MILITARY COMMITTEE OF THE BRITISH MEDICAL ASSOCIATION.

In response to a call by many of the officers present, the Chairman invited Lieut.-Colonel R. H. Elliot, I.M.S. (retd.) (Chairman of the Naval and Military Committee of the British Medical Association), to speak.

Colonel Elliot said that, though the call was unexpected, he was glad of the opportunity to say some things to those of his brother officers

still in the Service. First and foremost, he desired to express the debt of gratitude the Service owed to Mr. Montagu and to Sir Havelock Charles. He had received many letters from India and from this country which showed, amongst other things, that the work of the two gentlemen was not fully appreciated or understood. There was often doubt where there should be trust, and suspicion where there should be confidence. His position had given him every opportunity of knowing what had been going on, and he would ask the officers of the Service to exercise a little patience and to trust those who are working for them. Sir Havelock Charles had been the inspiration of the reforms recently promised. The I. M. S. had no more loyal friend than the Surgeon-General at the India Office, but his path has been thorny and difficult. His efforts, however, would have been fruitless but for the sympathy and statesman-like grasp of the position shown by Mr. Montagu. Colonel Elliot said that in his dealings as a representative of the British Medical Association with the Secretary of State he had been impressed by his sympathy, kindness, and courtesy, and his genuine desire to appreciate the position of the Service and to help its officers. Mr. Montagu, in his replies to the deputation at the two interviews it had with him, took the claims presented one by one, and showed that, so far as lay in his power, he was determined to satisfy them, and so build up a happy, contented, and prosperous service. "So impressed," Colonel Elliot continued, "was I with the way he had met us, that I gave my promise that we would help him in turn. Many of my correspondents are suggesting that we are going too slow, but let me remind you of certain points. The Secretary of State has no easy task before him, and we should ill requite his attitude towards us if we added to his difficulties instead of striving to lighten them. At his instigation a Commission on the Medical Services has recently toured the whole of India, and its recommendations are now before the Government of India; we hope soon to learn what action that Government proposes to take on the recommendations made to it. We must wait patiently, we must give Mr. Montagu the time and the opportunity to make good his promises to us. Of one thing I am absolutely convinced, and that is that

he will loyally fulfil those promises in the letter and in the spirit. He has made it clear to us from the start that he is not all-powerful—I only wish he were—but we must give him a fair chance first, and if he fails to satisfy us, I am sure it will be through no fault of his own. If we were to take any other course, and to act as some of my correspondents have suggested, we could neither ask nor expect him to trust us again. We have a sympathetic Secretary of State; we have a Surgeon-General at the India Office who is one of ourselves to the backbone; we have a Director-General in India than whom there has probably never been a better for such a time; and last, but not least, we have behind our cause at home the British Medical Association. I would ask each one of you, when you go out, or write out to India, to ask our brother officers out there to exercise patience and trust. There are grouchers in every service; I am a groucher to-night; my grouse is against the officers who say the British Medical Association has done nothing for them, and who have never read the *Journal* to find what we have been doing. For the last six years the Association has put in steady unwearying work, making sure of its ground, consolidating every position, and advancing steadily, if slowly, to the end it has in view—namely, the establishment of the Service on a proper footing. The debt of the Indian Medical Service to the British Medical Association is one it cannot easily repay."

THE NEW TREATMENT OF CHRONIC PARENCHYMATOUS NEPHRITIS.

WE wish to refer very briefly to the case of chronic parenchymatous nephritis, with very massive oedema, anasarca and water-logging of the tissues and serous cavities, recorded in the *Mirror of Hospital Practice*, in the present issue of the *Gazette*. The one point we desire to bring to the attention of our readers is the deduction to be drawn from the effects of dietetic treatment on the functional capacity of the kidney. In this patient the kidneys seemingly had become so diseased, disorganised, etc., that, despite the administration of the whole array of diuretics, all that the kidneys were able to excrete was contained in an average quantity of twelve ounces of urine daily for a period of forty-two days. It would naturally be assumed that kidneys so completely thrown out of action must be in such

a serious pathological condition that little or no hope of recovery of their functional capacity could be entertained. Yet, what are the facts? Whether *post hoc* or *propter hoc*, no sooner had the patient been placed on a very high protein dietary—mostly composed of animal protein—than the kidneys, which heretofore were seemingly completely disorganised and absolutely unable to perform their ordinary function, began to excrete water, nitrogenous bodies and salts, as if practically no structural changes or pathological condition existed. This is a most remarkable result, and one that must give us all cause to think. The patient was *in extremis*: there had been relatively almost complete suppression of urine for many days: nothing seemingly could be done to relieve the distress or determine a free flow of urine, yet within a few days the same kidneys that were incapable of excreting more than a few ounces of urine, a few grammes of urea and a minimum of other constituents, suddenly became active and showed that their functional capacity was practically unimpaired, and that seemingly they were not to blame for the serious state into which the patient had passed. If the kidney is not the culprit, where are we to look to discover the cause of all the trouble? Supposing this patient had died—and he was very near death,—what would have been the post-mortem findings of the kidney condition? Judging from the present state of our knowledge, would the findings not have been marked renal disease and a condition of parenchymatous nephritis so severe that the kidneys were unable to excrete anything, and the pathological condition found post mortem would have been accepted as a complete explanation of the cause of death.

We know, however, that the kidneys were in reality quite able to perform their function. We must therefore look somewhere else for an explanation of this failure of the renal organs. The depleted albuminous condition of the blood, with its lowered osmotic tension, may afford a feasible explanation.

If the effects of diet in increasing the albumen content of the blood, and so raising the osmotic tension, should prove a reliable and certain method of ridding the tissues of œdema and thus preventing death from suppression of urine, chronic parenchymatous nephritis may be robbed

of its terrors and our ideas of the *fatal* character of the disease may require to be reconstituted.

Last month in our editorial columns we discussed in some detail the recent work that has been done on kidney disease. It is too early yet to write definitely on the value of the new method, but, to any one who had seen the patient referred to before the change of diet and could see him now, the complete change in every detail of his appearance would certainly give grounds for hope and confidence that a real step forward has been taken in the treatment of one of the most fatal forms of a serious disease.

Current Topics.

TRENCH FEVER: A SUMMARY FROM THE LITERATURE.

By MAURICE BUCHHOLTZ, Acting Assistant Surgeon,
United States Public Health Service.

[From the Public Health Reports.]

Definition.—Trench fever is a blood infection, communicable from man to man, by means of the louse and possibly other parasites. There are no pathognomonic signs or symptoms recognized. It is not fatal, but the morbidity resulting from it exceeded that from any other disease on the Western Front. Many are permanently unable to resume their former duties, and some pass back to civil life incapacitated—a charge on the State. The disease may arise and spread wherever the body louse is prevalent, provided persons already infected are sent there from endemic areas.

Symptoms.—The onset of the disease is usually sudden, but in some cases a gradual onset is observed. The disease is characterized by recurrent pyrexia, headache, giddiness, pain in the back and limbs (chiefly in the legs, and of considerable severity), a slow pulse in comparison to the degree of fever, conjunctival congestion, sweating, polyuria, a moderate degree of leucocytosis at the height of the fever, with evidence of blood infection and involvement of the spleen and, in some of the cases, of the liver also. A certain number of the patients pass into a stage of chronic ill-health, that is, they suffer from recurrent pains in the limbs, headache, and nervous manifestations such as mental depression, excessive tendency to sweating, disordered action of the heart, mild degree of anemia, and some loss of weight. Damp weather produces exacerbation of the pains in the late stages of the disease. The infection, in some cases, is very persistent, and acute febrile relapses may occur after months of quiescence.

Prodromal symptoms in the cases of gradual onset have been noted in the following order of frequency: Pain in the head, pain all over, weakness, pain in the legs, malaise, and dyspnea. The prodromal period lasts for two days or longer, the severity of the symptoms gradually increasing during the first few days. In a relapse the symptoms are often more severe than in the initial attack.

The headache associated with trench fever is usually frontal in character and behind the eyes, but may be bitemporal or occipital. It is most severe, persistent, commonly recurrent, and is not associated with tenderness of the scalp. When occipital it is often accompanied by stiffness in the back of the neck. The pain in the

limbs is either (a) dull aching or gnawing more or less continuous, always worse at night, or (b) acute pain, shooting or stabbing in character, which may last many hours, specially at night. The pain is nearly always felt in the bones and most frequently in the tibia.

After a few days the general pains subside and localized pain becomes prominent. This is usually symmetrical, varying from day to day. The joints may be painful and stiff, but there is no swelling. Sometimes the pain in the right iliac region is so severe as to give rise to the diagnosis of appendicitis. The spleen is palpable two fingers breadth below the costal margin. In a number of the cases there is alternately shivering and sweating, which occurs several times in the course of a single day or night. Another symptom is frequent micturition, not painful but associated with a great increase of urine. Polyuria occurs as the temperature falls; the pulse is slow; affections of the respiratory tract are usually conspicuous by their absence. Areas of tenderness are frequently associated with the pains and may involve all the structures from the skin down. During an acute attack the patient's general condition obviously deteriorates and he presents an appearance of exhaustion. In addition to this he becomes anæmic and steadily loses weight.

For a period varying from a few days to about a fortnight from the onset of the disease the acuteness of the patient's pain persists, especially in portions of his limbs; and walking increases the pain. If a recurrence sets in, even though quite late, the recurrence may be more severe than the original attack.

Two clinical types have been observed. In one there is a short evanescent fever lasting from a few days to a week and frequently followed after a few days of apyrexia by a single short relapse. In the other there is a series of febrile relapses, interrupted by periods of apyrexia.

Pathological Changes.—Although the mode of transmission has now been well established, the causative organism remains to be found. So far as the blood is concerned, there is evidence of abnormal activity of bone marrow. A moderate and rapidly varying leucocytosis precedes and accompanies the fever waves. In afebrile intervals the mononuclear elements are relatively increased. The urine usually shows a trace of albumin; a true nephritis, however, is rare. With the fall of temperature the amount of urine increases.

Differential Diagnosis.—The most important disease from which trench fever must be differentiated is influenza. The two diseases have in common the sudden onset, with fever and generalized pains. In trench fever the prostration, however, is usually less than it is in influenza, and there are no signs of inflammation of the respiratory tract, while in influenza skin pains and relapsing type of fever are absent.

Prognosis.—About 90 per cent. of all cases respond quickly to the ordinary symptomatic treatment and return to duty in a few weeks. In the remaining 10 per cent. the disease pursues a more obstinate course and the average duration of disability is from five to six months. In the chronic cases the patient's weight is the best guide to prognosis. As recovery takes place, the weight steadily increases.

Sequelæ.—Chief among the sequelæ of trench fever are disordered action of the heart (the so-called irritable heart of soldiers), neurasthenia, and myalgia or "rheumatism."

The first-mentioned is characterized by breathlessness on exertion, palpitation of the heart, pain over the precordium, and giddiness. Although the heart is not enlarged and the sounds are normal, the patient is markedly exhausted. The condition ultimately may lead to neurasthenia.

The clinical phenomena of disordered action of the heart embrace profuse sweating, flushing, headache, throbbing of the vessels of the neck, tremulousness, and, in some cases, discomfort in the throat and chest. These phenomena have been attributed to hyperthyroid-

ism; but the administration of thyroid extract by no means tends to exaggerate the symptoms of disordered action of the heart; on the contrary it causes definite relief.

The transmission of trench fever: summary of evidence from experimental work.—1. The whole blood from febrile cases of trench fever up to the 51st day of the disease, when injected intravenously, is capable of producing the disease. The incubation period in such infections varies greatly—from 5 to 20 days.

2. The virus as contained in the circulating blood is destroyed by the addition of distilled water in large quantities.

3. The bites alone of infective lice appear not to produce trench fever.

4. The excreta of infective lice when applied to a broken surface of skin do readily produce trench fever. The incubation period of such infections is fairly constant and averages eight days.

5. The excreta passed by lice fed on trench fever patients are not infective until the expiration of not less than seven days from the commencement of the feeding on trench fever blood, thus indicating either a developmental cycle in the louse or a period during which the organism multiplies.

6. Once lice are infective they remain so until at least the 23rd day from the date of their infection.

7. The virus of trench fever, as contained in infected louse excreta, is capable of withstanding drying at room temperature, exposure to sunlight, keeping for not less than 16 days, and heating to 56° C. for 20 minutes.

8. A temperature of 80° C. for 10 minutes destroys the virus—a fact which indicates that it is not a spore-bearing organism.

9. The bodies of infected lice when crushed on the broken skin are capable of producing trench fever.

10. Active trench fever blood equivalent to the content of 11 lice does not produce trench fever when rubbed into the broken skin.

11. Infection probably does not take place by the mouth or inhalation.

12. The excreta of lice are not normally capable of producing trench fever.

13. Trench fever infected lice do not transmit the disease to their offspring.

14. Some attacks of trench fever may be afebrile throughout.

15. The percentage of individuals naturally immune to trench fever is exceedingly small.

16. Old age is no bar to infection.

17. Such immunity as results from an attack of trench fever is not permanent and may persist only so long as the individual shows evidence of the disease.

18. Even as late as the 79th day of the disease a patient's blood may remain infective and be capable of infecting lice fed on such a patient while febrile.

19. The different varieties of trench fever result from differences in persons infected rather than from differences in the sources of infection.

Prophylaxis.—From what has been said it is clear that prophylactic measures must concern themselves chiefly with the delousing of infected persons. In addition to this, the application to the underclothing of a mixture, compound of crude naphthalene, 4 parts, and soft soap, 1 part, is recommended.

Lousy clothing should be disinfected by heat or other effective procedure. Billets, dugouts, and like places should be fumigated with sulphur dioxide or hydrocyanic acid gas in order to kill the lice.

Treatment.—Rest, combined with moderate exercise, and thyroid therapy (not specific treatment) reduce the incidence of disordered action of the heart, provided the treatment is begun early enough. Aside from this, the treatment is purely symptomatic.

THIRD WAVE OF INFLUENZA HITS ENGLAND.

ACCORDING to official advices from England there has been another recrudescence of influenza in many parts

of that country, so that the disease continues to be a matter of grave concern to the sanitary authorities.

Two well-marked waves of influenza have swept over England in the past few months and the country is now in the midst of a third. That the condition is serious is shown by the following official table, which gives the number of deaths from influenza in 96 large cities in England and Wales, each of which had a population of 50,000 or over at the Census of 1911. The total population is thus estimated as somewhat over sixteen and one-half millions in 1918. Newspaper cable advices dated March 28, indicate that this third wave has continued with great severity.

Deaths from influenza in 96 large cities of England and Wales, Dec. 1, 1918, to Mar. 1, 1919, by weeks.

Week ended	Number of deaths.	Week ended	Number of deaths.
1918.		1919.	
Dec 7 ...	3,574	Jan. 18 ...	274
Dec. 14 ...	1,885	Jan. 25 ...	224
Dec. 21 ...	1,715	Feb. 1 ...	272
Dec. 28 ...	581	Feb. 8 ...	606
		Feb. 15 ...	1,364
1919.		Feb. 22 ...	3,054
		Mar. 1 ...	3,889
Jan. 4 ...	442		
Jan. 11 ...	379		

TYPHOID-PARATYPHOID FEVERS.

COLONEL WALTER D. McCaw, Chief Surgeon, American Medical Corps, makes some trenchant remarks in his article on typhoid-paratyphoid fevers published in the Public Health Reports of the U. S. Public Health Service.

TYPHOID-PARATYPHOID FEVERS.

In view of the appearance and continued incidence of fevers of the typhoid-paratyphoid group in many units of the American Expeditionary Forces during the past five months, it is deemed essential to review this subject at the present time, particularly from the viewpoint of early diagnosis, prevention, and control.

The occurrence and distribution of typhoid-paratyphoid in our troops has constantly and continuously been brought to the attention of all medical officers serving with the American Expeditionary Forces through the medium of the weekly bulletin of diseases. It would appear, however, that many officers have utterly failed to grasp the significance of these reports and warnings—a fact which may be due to a false sense of security under the popular belief that vaccination against typhoid and paratyphoid gives a complete immunity even in the midst of gross insanitary conditions.

Notwithstanding the fact that typhoid and paratyphoid fevers are endemic in the United States, and in spite of our extensive experience with these diseases during the Spanish-American war and later during the period of mobilization on the Mexican border, it is evident that many medical officers have gained but little knowledge of the fundamental principles underlying prevention and control. It is also quite evident that some medical officers are grossly careless and neglectful of their duties and responsibilities as medical officers and sanitarians.

This office realizes fully that the United States has raised within a short period of time an army of several millions of men, who have been poorly instructed in personal hygiene and sanitation; it realizes that 2,000,000 of these men have been brought to France, where they have encountered environmental conditions differing entirely from those existing in the United States; it is

fully recognized that military necessity has at times rendered sanitary control extremely difficult, especially during the stress of active combat.

To our regret, be it said, the high standards of sanitation and personal hygiene set by the Medical Department during the past 10 to 15 years have not been lived up to during the past one and one-half years. This has been due to a combination of factors, the more important of which have been the lack of facilities and materials, transportation difficulties, and insufficient training and personnel. However, many medical officers serving with combatant and S. O. S. units have been able to overcome all handicaps, and have by wise counsel and by eternal vigilance succeeded in keeping their units in excellent fighting trim.

The actual physical fighting is now at an end, and the time-worn excuse that "There is a war on" will no longer be tolerated. But the fight against disease still continues.

The greater part of the American Expeditionary Forces is now relatively in training areas or with the armies of occupation, where definite sanitary measures can be instituted and enforced, where instruction of the line troops can be carried out, and where opportunity is presented to initiate rules of personal hygiene. Medical officers will therefore be held responsible for the proper supervision of the health of troops.

Summary of Typhoid-Paratyphoid Incidence in the American Expeditionary Forces.—In order that all medical officers in the American Expeditionary Forces may have a somewhat comprehensive view of the occurrence of these fevers in the American Expeditionary Forces, the following brief review is presented:

(a) From June 1, 1917, to June 1, 1918, but few cases occurred. The rate was well within the limits to be expected in view of the sanitary conditions under which the troops were of necessity living. The cases were sporadic and only occasionally did secondary cases develop.

(b) In July, 1918, a replacement unit consisting of 248 men from Camp Cody, N. Mex., reached England with typhoid prevailing extensively; 98 men, or 39.5 per cent. had typhoid, and the case death-rate was 8.42 per cent.

It was evident from the investigation that the men were exposed to infection through contaminated drinking water while en route to the port of embarkation in the United States. The unit had been vaccinated a few months prior to the occurrence of the epidemic. Most of the patients presented the typical clinical features of typhoid. The percentage of positive bacteriological findings from the blood, feces, and urine was low, as no laboratory work could be done until late in the course of the disease.

(c) In August, 1916, a small but severe epidemic occurred in a detachment of Engineer troops stationed at Bazoilles. In this unit 15 cases of typhoid occurred, with a death-rate approximating 10 per cent. Typhoid was endemic in the civil population, and the epidemic was very definitely traced to a cook in the mess of this Engineer detachment, who remained on duty as a cook for five days after the onset of the symptoms. The epidemic was recognised in its early stages, and in all patients the disease was confirmed bacteriologically by positive cultures from the blood and feces.

(d) During the Chateau-Thierry offensive diarrhoeal diseases were very prevalent in the troops engaged—approximately 75 per cent. It was demonstrated bacteriologically in this area that the prevailing intestinal diseases were simple diarrhoea, bacillary dysentery, typhoid, paratyphoid A and B. The sick and wounded from this sector were evacuated to base hospitals in various parts of France. Very soon thereafter this office began to receive reports of cases of typhoid, paratyphoid, and bacillary dysentery from base hospitals. In practically all instances the patients had been evacuated from the Chateau-Thierry sector. The high incidence of intestinal diseases in this sector

was due to the entire disregard of the rules of sanitation. "Military necessity" and the impossibility of supplying auxiliary labour troops at that time prevented immediate police of the battlefields. In some of the cases involved in this series the diagnosis of dysentery or typhoid was made by the pathologist at autopsy. The percentage of positive bacteriological findings was low, as the correct diagnosis, if made, was not usually arrived at until late in the course of the disease.

(e) Both dysentery and typhoid-paratyphoid fevers were demonstrated to have prevailed to some extent in our troops after the St. Mihiel offensive but the epidemics of influenza and pneumonia prevailing at that time overshadowed all other medical admissions.

(f) Following the offensive in the Argonne sector, typhoid and paratyphoid began to be reported from practically all divisions engaged in that offensive. It is quite evident that the initial cases were due in large part to drinking infected water. The initial cases, however, in large part were not, in most instances, promptly diagnosed, and secondary cases from contact began to occur. In some divisions either the initial exposure was not great, the organizations were under good discipline, or the medical officers had a proper conception of their duties and responsibilities and but few cases occurred. In other instances the contrary was true and many cases have occurred. As examples of the two extremes, may be cited: the—Division, in which five cases occurred between October 1, 1918, and February 1, 1919, and the—Division, in which 115 cases occurred in the same period.

More than 300 cases of typhoid-paratyphoid may be attributed to the Argonne offensive. Eight hundred and seventy-four typhoids and paratyphoids have been reported in the American Expeditionary Forces since October 1, 1918. The percentage of confirmatory laboratory diagnoses has been low on account of the fact that the clinicians frequently failed to suspect the disease in its early stages.

(g) A small but severe epidemic occurred in the Joinville concentration area in December and January. In a group of Medical Department units (evacuation and mobile hospitals and sanitary trains) concentrated there 75 cases occurred, with a case death-rate of approximately 20 per cent. The cases were suspected in the early stages of the disease and the percentage of positive finding by culture of urine or feces has been greater than 75 per cent. The cause of this epidemic has not been completely analysed as yet, but there is but little question that it was due to the use of infected drinking water.

CLINICAL DIAGNOSIS OF TYPHOID AND PARATYPHOID FEVERS.

In view of the fact that the ordinary clinical picture of typhoid-paratyphoid is very frequently profoundly modified in vaccinated individuals, it is considered essential to enumerate briefly the usual clinical manifestations of these fevers, atypical modes of onset, differential diagnosis, and modifications of the usual clinical manifestations in vaccinated individuals.

1. *Clinical manifestations of typhoid and paratyphoid.*—Typhoid fever in the unvaccinated is commonly characterized clinically by symptoms due to the gradual development of a general bodily infection. The onset is insidious, with lassitude, malaise, gradual step-like rise in temperature with slight morning remissions until at the end of the first week a continuous fever of from 103° to 105°F. has been attained. The beginning of the attack is usually associated with anorexia, headache, and frequently with diarrhoea, abdominal distress, and epistaxis. The pulse is not increased in proportion to the temperature, is of low tension and dicrotic. The tongue is coated and white and the abdomen distended and tender. From the seventh to the tenth day the rash appears in the form of slightly raised, flattened papules of from 2 to 4 mm. in diameter, which can be distinctly felt, are of

a rose-red color, and fade on pressure. These rose spots, characteristic of typhoid and paratyphoid, appear singly or in crops, usually first on the skin of the abdomen and lower thoracic region, but may occur only on the back or extremities. The individual rose spot persists for from two to three days, after which it fades, leaving a brownish stain which persists for some time. Toward the end of the first week the spleen enlarges and its edge can be distinctly felt below the costal margin.

At the end of 1st days the symptom complex clinically characteristic of typhoid—continuous fever, rose spots, and enlarged spleen—is usually established. To this should have been added laboratory findings of absence of leucocytosis and in the majority of instances a positive blood culture, which occurs most frequently during the early stage of the disease. One negative blood culture will not suffice, but repeated examinations at 48-hour intervals will be made in suspicious cases.

During the second week, there is continued high fever with slight morning remissions. The pulse becomes rapid and loses its dicrotic character, the patient becomes dull and stupid, the lips are dry, the tongue is dry and covered with a dirty brownish coat and tremulous. Abdominal symptoms when present—tympanites and diarrhoea—are more pronounced and the clinical picture becomes one of intense toxæmia. In the third week, in favourable cases, the morning remissions in temperature become more marked, the fever becomes distinctly remittent in type and toward the end of this period a gradual fall in temperature by lysis is noted. Rose spots cease to appear. In severe cases the pulse is weak, ranging from 110 to 130, and pulmonary complications, especially pneumonia and hypostatic congestion may occur. The patient is dull and apathetic, and low-muttering delirium and subsultus tendinum are common. During the fourth week convalescence begins, the temperature gradually reaches normal, the abdominal symptoms subside, the tongue becomes clear, and the desire for food returns. In severe cases convalescence may be delayed until the fifth or even the sixth week, in which case the fever continues high during the fourth week, and it is only toward the end of this period that marked daily remissions make their appearance.

In individuals previously vaccinated against typhoid but who have completely lost their immunity, infection similar to that found in the unvaccinated occurs, giving rise to the symptom complex described above as characteristic of typhoid fever.

Infections occurring in the vaccinated individual who still possesses a certain degree of resistance to infection result in the appearance of atypical clinical pictures, such as abortive types of typhoid and paratyphoid in which the constitutional symptoms are mild, with but slight febrile reaction of atypical type and few if any rose spots. The onset may be either insidious with headache, loss of appetite, and fatigue, or acute and associated with chills, vomiting, intestinal cramps, and diarrhoea. Fever may be wholly absent or evanescent in character and determined only if observations are made within the first 48 to 72 hours. A low type of temperature, with daily fluctuations of from 98.6 to 100.4 suggestive of the presence of tuberculous disease may persist for a week to 10 days. It is in this class of cases that blood cultures taken early in the course of the disease, and repeated if negative, frequently give definite information concerning the nature of the infection. Ambulatory types of typhoid are not uncommon and the first indication of the existence of the disease may be furnished by the occurrence of intestinal hemorrhage or perforation.

The vaccinated individual protected against general systemic infection may still act as a carrier of typhoid infection, and frequently shows clinical manifestations of local disease of some portion of the gastro-intestinal tract, while the characteristic symptom complex of typhoid fever due to general infection, namely, continued

fever, rose spots, and enlarged spleen, may be wholly absent.

2. *Distinctive complications.*—Intestinal hemorrhage occurs usually during the third or fourth week. The onset is marked by a sudden and frequently pronounced fall in temperature associated with increased gravity of the general condition and a rise in pulse rate.

Intestinal perforation occurs usually during the third or fourth week. Patients whose sensorium is not too clouded complain of sudden paroxysmal abdominal pain, usually referred to the right hypogastric region. Signs of peritoneal irritation rapidly become manifest. Vomiting is common. Hiccough and irritability of the bladder with frequent micturition may be noted. Physical examination of the abdomen reveals tenderness and muscle rigidity, most marked in the right hypogastric or iliac region. Obliteration of liver dullness is frequently present and constitutes an important sign. Acute abdominal symptoms associated with a suddenly appearing leucocytosis are indicative of perforation. The occurrence of intestinal hemorrhage or signs of intestinal perforation in an individual giving a history of previous ill health should always lead to the suspicion of the existence of typhoid.

3. *Atypical modes of onset.*—(a) Acute onset with symptoms simulating meningitis. Lumbar puncture differentiates.

(b) Acute onset with intense, usually generalized, bronchitis or symptoms suggestive of lobar or bronchopneumonia.

(c) With chills, fever, vomiting, cramp-like pain in abdomen, sometimes localized in right iliac fossa and suggesting appendicitis.

(d) With symptoms of acute nephritis. Attack begins suddenly with nausea, vomiting, pain in lumbar region, diminution in secretion of urine, which is highly colored, and contains albumin and casts.

(e) Special mention should be made of the ambulatory type of typhoid, in which the symptoms are slight, consisting simply of headache and lassitude associated with mild gastrointestinal disturbances. The patient is at no time confined to his bed and intestinal hemorrhage or perforation may furnish the first clue with regard to the existence of typhoid.

(f) In the above atypical modes of onset early blood cultures are of importance in differentiation.

4. *Paratyphoid fevers.*—The paratyphoid fevers due to infection with A or B organisms are evidenced clinically by the same general symptomatology as that of typhoid. They, however, as a rule, run a much milder course and the intense toxæmia of typhoid, evidenced by marked apathy, muttering delirium, and subsultus tendinum, is seldom present. The onset of paratyphoid is frequently more abrupt, with acute gastrointestinal symptoms resembling food poisoning. The intestinal symptoms are as a rule more marked in cases of infection with paratyphoid B than in cases in which paratyphoid A is the causative factor. The fever in paratyphoid is not of as long duration, nor is it as continuous as in typhoid, but is more distinctly remittent in type. Enlargement of the spleen, rose spots, and absence of leucocytosis are, as a rule, present in all three infections. Attempts have been made by some authorities to distinguish between the eruptions of paratyphoid A, paratyphoid B, and typhoid. Thus the spots in paratyphoid A are said to be larger, more macular in type, of a darker reddish hue, and to correspond more closely to the eruption of measles. However, histologically the rash is the same in all three instances, and it is doubtful if a clinical distinction in type of eruption can be maintained. Rose spots may be wholly lacking or may be profuse and widely distributed over the body surface. The occurrence of relapse is more frequent in paratyphoid than in typhoid proper, and particularly is that true in connection with type A infections. In contradistinction to the relapse of typhoid, that of paratyphoid is frequently more severe than the original attack. The

distinction between mild typhoid, paratyphoid A and paratyphoid B can be made definitely only by the isolation of the infecting organism from cultures of the blood, urine, or stools.

5. *Differential diagnosis.*—Influenza: Many cases originally diagnosed as influenza in the American Expeditionary Forces have subsequently proven to be typhoid. The symptoms which the two diseases have in common are continuous fever without localizing symptoms and slow pulse associated with absence of leucocytosis. The more abrupt onset, the intensity of the headache, the severe pain in the back and eyeballs, and the early prostration occurring in influenza are distinctive. Supposed influenza in which the fever persists for more than four days, and which is not associated with signs of respiratory involvement, such as a bronchitis, usually most extensive in the lower lobes, a bronchio or lobar pneumonia, should be viewed with suspicion. It should be remembered that a general bronchitis is not uncommon in typhoid. The appearance of rose spots should determine typhoid. Intestinal types of supposed influenza should always be considered as possible typhoid until proven otherwise.

Acute miliary tuberculosis.—A family history of association with tuberculosis individuals, a personal history of previous attack of pleurisy or pulmonary hemorrhages, physical signs of old tuberculous pulmonary lesions, cyanosis appearing early in the disease associated with increased rate of respiration, a greater irregularity of temperature curve, and a more rapid pulse with absence of dicrotism, suggest acute miliary tuberculosis. Röntgenograms of the chest and blood cultures frequently give valuable differentiation.

Septicæmia.—In cases of late typhoid admitted to the hospitals during or after three weeks of profound toxæmia, together with the, by this time, distinctly remittent temperature, may suggest septicæmia. The slight daily fluctuation in the general condition of the patient, together with the absence of chill and leucocytosis, suggest typhoid. Blood cultures will always be made in such cases, and, if negative, cultures of the stools will be made for the presence of typhoid-like organisms.

6. Local and unexplained gastrointestinal derangements, gastritis acute or chronic, diarrhœa, dysentery, gastroenteritis, enterocolitis, colitis, appendicitis, cholecystitis, and acute catarrhal jaundice all occurring with or without fever should be regarded with suspicion when admitted from commands in which cases of typhoid or paratyphoid have occurred, and examination of the stools for the presence of typhoid-like organisms should be made.

Laboratory diagnosis of typhoid and paratyphoid fevers.—Bacteriological procedures are of great value (1) for the certain and early diagnosis of suspected cases, (2) to determine carrier state in convalescent positive cases, (3) to detect carriers in otherwise normal individuals.

Blood cultures offer the most certain method for early diagnosis of undetermined fevers, and it should be kept in mind that the earlier in the disease the blood culture is taken the more likely is the result to be positive; thus, in positive typhoid fever, the chance of successful blood culture declines from 90 per cent. during the first week to 40 per cent. during the third week. In paratyphoid A fever, because of the frequently short and mild febrile period, the prompt and early blood culture is all the more necessary. Relapses are more common in paratyphoid than in typhoid, and taken at such a time, blood culture yields positive results in every case.

The following method of blood culture is recommended as being suitable in all cases of fever of undetermined ætiology.

(a) When laboratory facilities are at hand, take 10 c.c. of blood from a vein at the elbow. Place 3 c.c. in each of two flasks containing 100 c.c. of plain broth. Place

one c.c. in tube of agar (melted and cooled to 45° C.), immediately mix and pour plate. Place remainder of the blood in dry sterile test tube to separate serum for such serological tests as may be suggested.

The two flasks and plate are incubated and examined the following day. Transplants are made to plain agar slants, or better, Russell's double sugar agar. In case of development of gram-negative motile bacilli on agar slants, emulsions should be made and agglutination tests done with immune sera for final identification.

Frequency of non-agglutinability of recently isolated typhoid cultures should be kept in mind. Negative blood culture in suspected typhoid fever means little. Repeat if clinical conditions indicate.

(b) If the blood culture specimen cannot be taken directly to the laboratory, filtered sterile ox bile is most useful, 5 c.c. in a tube. To such sterile ox bile 5 c.c. of blood is added, the tube closed with a sterile paraffin cork, carefully packed and sent for examination to the nearest laboratory.

Bacteriological examination of the feces is second only to blood culture as an important means of positive diagnosis. It is especially important in paratyphoid B fever.

Typhoid or paratyphoid carriers.—Typhoid and paratyphoid patients excrete the bacilli, frequently with their urine and practically always in their feces. This is most likely to occur during the third and fourth weeks of the disease, the condition may persist throughout convalescence and not infrequently longer. It is, therefore, important not to release the convalescent typhoid or paratyphoid fever patient until he ceases to excrete these bacilli.

Three negative cultures of the urine and feces at six-day intervals should be required before release of patient, the first not earlier than one week after temperature curve has become normal.

Some persons who have never had a clinical history of the disease may excrete typhoid or paratyphoid bacilli. It is important to detect such carriers in any occupation, but especially among cooks and handlers of foodstuffs. In such a carrier survey two examinations should be done on each individual.

For release of patients therefore, and detection of carriers, the examination of feces is of especial importance. It is a procedure that properly requires the most careful attention of the bacteriologist. A bit of fresh feces the size of a pea (or better, when feasible, 1 c.c. of liquid stool, obtained, if diarrhoea is not already present, by administration of a saline cathartic) is mixed with 10 c.c. of plain broth or sterile salt solution, then allowed to stand and sediment for 15 minutes. One or more loopfuls are taken from the top and placed on the surface of one plate of hardened Endo medium. This droplet is carefully carried over the surface by means of a glass elbow rod or similar spreader and without further inoculation, the same rod is used to seed a second Endo plate. In this way a satisfactory separation of the colonies may be secured. After incubation overnight suspicious colonies are fished to plain agar, agar slants, or better, Russell's double sugar, and the identification completed by agglutination tests.

Evacuation of typhoid carriers.—Whenever it becomes necessary or desirable to evacuate a carrier of typhoid or paratyphoid fever to the United States, the carrier shall be evacuated as a patient on sick report.

The Widal test, in view of previous vaccination with T. A. B. vaccine, has been generally held of little or no value; however, it should be stated that the determination of agglutinin-titer of patient's serum at intervals of one week and the demonstration of progressive and marked increase of agglutinin-content of the blood offers especially in the absence of positive blood culture, excellent evidence as to the aetiology of the disease. Thus, in typhoid fever an agglutinin-titer (Widal test) of 1 to 40 during the first week of the disease may advance to 1 to 1,280 during convalescence. In paratyphoid B fever the titer frequently advances to 1 to 2,560;

however, in paratyphoid A fever it may not reach 1 to 640.

HÆMOGLOBINURIA DUE TO B.-NAPHTHOL.

HOWARD (R). A note on Hæmoglobinuria due to Beta-Naphthol Poisoning.—*Trans. Soc. Trop. Med. and Hyg.* 1918. July. Vol. 11.

The danger attached to the use of beta-naphthol is said to be that in some cases it causes an acute nephritis with hæmaturia, specially in patients who have damaged kidneys, and it is advised that this drug should never be given when albumin is present in the urine. The author finds after treating several thousand cases in German East Africa and Zanzibar that no serious results have followed the use of the drug; the only special precaution taken being that patients with albuminuria were given thymol instead of beta-naphthol. Notes are given of hæmoglobinuria occurring in seven cases. One case died. "The cause seems to be an individual susceptibility to the toxic action either of beta-naphthol itself or, more probably, of some impurity which is found in it, especially in the post-war preparation of the drug. It is impossible to judge beforehand what cases will be specially susceptible." In practice amongst natives the best danger signal for which to watch is the occurrence of vomiting, as it generally precedes the hæmoglobinuria and the jaundice and is most noticed by the patient. Those specially susceptible can be safely treated with thymol.—(*Tropical Diseases Bulletin.*)

STYRACOL IN THE TREATMENT OF DYSENTERY.

RAUERT. Styralcol in the Treatment of Diarrhoea and Dysenteriform Diarrhoea.—*Med. Klinik.* 1918.

Rauert recommends styralcol in the treatment of dysenteriform diarrhoea since it causes a rapid disappearance of the blood from the stools and a more favourable course of the disease. Styralcol is the cinnamic acid ester of guaiacol. It is insoluble in gastric juice, but in intestinal juice it is dissolved and split up and yields guaiacol. Tablets of 1 gramme for adults or 5 grammes for children are given thrice daily for three or four days when astringents should be administered.—(*Tropical Diseases Bulletin.*)

THE TREATMENT OF SCABIES.

THE obvious disadvantages of the sulphur treatment of scabies render any efficient alternative method acceptable.

This is to be found in the copper sulphate method, which appears to be very little known. The patient is given a hot bath, during which scrubbing of the affected parts with a hand brush is carried out. He then dries himself and puts on some clothes—perfectly clean pyjamas—and waits for an hour, until the skin has resumed its normal state. He then strips and is painted over with a 4 per cent. solution of copper sulphate in water, care being taken to ensure that the interdigital clefts and other similar parts are not missed in the process of painting. He dries by evaporation in the sun or before a fire and replaces his clothes.

The painting is repeated daily for two or three days, after which he again bathes in hot water and clothes himself in a complete change. If the lesions are limited, it is unnecessary to do more than paint the affected parts, but if they are very extensive, with much excoriation from scratching, it is advisable to paint the body in sections—e.g., arms and trunk one day, lower limbs, buttocks, etc., the next day, in order to avoid the slight risk of too rapid absorption of copper giving rise to poisoning.

Treatment of the pustular conditions resulting from scratching can be carried on simultaneously with—but preferably after—the copper sulphate treatment, and for this the vigorous application of unguentum hydrargyri oxidi flavi, B. P., is the best. Occasionally fomentations may be required in various parts which have become more deeply infected.

To ensure a cure by this method, as with all others, steps must be taken to prevent reinfection from clothes and bedclothes. In the army this can be done by Thresh disinfection of blankets and outer clothes, and boiling of shirts, drawers, etc.

In civil practice under-garments are similarly dealt with—outer clothes are reversed and ironed with a hot flat iron applied directly. Blankets may be ironed similarly, or exposed to air, and if possible to sunlight for at least three days. The advantages of this treatment are:—

1. Certainty of cure in a short time. If there is no reinfection cure results after three applications to any one part.

2. Avoidance of the irritation due to sulphur.

3. Avoidance of the grease and general messiness of the sulphur ointment method.

This is a point of very considerable importance in private practice, especially with female patients.

4. Simplicity of the method; which does not require intelligence from the patient or much time from the practitioner.

I have had considerable experience of this method in the army, and by it have treated successfully not only British troops, but also Macedonian muleteers and Turkish prisoners, whose co-operation in cleanliness is not always easy to obtain.—(H. WEBB, in the *Guy's Hospital Gazette*.)

WAR EXPERIENCE OF MALARIA.

By SIR RONALD ROSS.

REGARDING the actual treatment of febrile attacks or relapses in malaria, I think that the following points have been pretty conclusively established:

1. Moderate doses of quinine—say, between 20 and 40 grains daily for adults—suffice in the vast majority of cases to reduce both fever and asexual parasites within two or three days.

2. I think that the sulphate, bisulphate, hydrochloride, and bihydrochloride of quinine are almost equally efficacious within narrow limits, but there may be clinical reasons for the occasional selection of one of these salts. Their elimination by the kidneys appears to be finally about equal.

3. Roughly, the same thing can be said regarding the three modes of administration—namely, orally, intramuscularly, and intravenously. Many prefer the third for rapid action, especially in first attacks, in serious attacks, and for other reasons. With much vomiting or gastro-intestinal disturbances the intramuscular and intravenous methods must be preferred; but many workers assert that the oral administration is generally as good, while it is obviously much more easily given. On the other hand, I have heard many “non-official” reports of occasional local mischief caused by the intramuscular injections; and, on the whole, see no reason why the oral administration should be superseded as a general broad procedure in malaria. Relapses occur with about equal frequency with all modes of administration after stoppage.

4. Rest in bed and good feeding are required during the attack and for about four days after the temperature returns to normal.

5. In first attacks and in complicated and serious attacks, larger doses than those mentioned in (1) above are very generally advocated by clinicians; but we have

not had very much experience of such attacks in the United Kingdom, and I think that the point still requires more investigation.

6. Many think that the malignant parasite requires much more rest and continuous treatment after attacks than do the other species of parasite.

Regarding what I have somewhat tautologically called “anti-relapse prophylaxis,” there is now a large amount of evidence to the effect that while men are actually taking about 60 to 90 grains of quinine every week their relapses will be infrequent, especially if the men are at the same time getting good food and a sufficient amount of exercise in the open air. The most remarkable case in proof of this occurred when many battalions were moved from the Salonica to the French front, and were subjected to a three months' course of such treatment under the strict supervision of Lieut.-Colonel Dalrymple, C.M.G., O.B.E., R.A.M.C. He succeeded in sending two whole divisions of these troops into the firing line, where the malarial factor became negligible. Similar results have been reported from English Malaya Concentration Centres by Captains Fraser and Cooke; and I am shortly communicating abstracts of the results in both these cases to the medical press.

The essential points of this anti-relapse treatment are that quinine shall really be given, under strict discipline or supervision; that the patients shall be living a healthy, vigorous life and shall be well fed meanwhile. The treatment does not absolutely prevent all relapses, but certainly reduces their frequency while it is being given; it generally allows the men to recover weight, to lose anæmia and other secondary symptoms, and, in many cases, apparently to throw off the infection entirely by some unknown natural process of cure. The daily dosage is generally advisable for administrative reasons, but many observers suggest that the total weekly amount can be more effectively given only on two or three days a week, or that even smaller total amounts may be so administered with equal advantage. Decision on this point generally depends on local or special conditions. Many clinicians also like to add arsenic, iron, and other drugs to the quinine for the above purpose.

Regarding the absolute cure of malaria infection, I regret to say that the results have not been nearly so definite. Numerous “sterilizing” treatments have been tried, but none of them has yet proved certainly efficacious. As a rule, very large doses of quinine—intramuscular, intravenous, oral, or combined—have been advocated, often associated with klarsivan and other preparations. I think that a large proportion of cures has sometimes followed; but in view of the admirable effects of such a simple treatment as the anti-relapse prophylaxis outlined above, I doubt whether these sterilizing treatments are really justified. At the same time I do not wish to discourage in any way attempts to find a more satisfactory form of permanent cure.

The general result of all this, as regards military and pension practice, appears to me to be that cases of malaria should, after the treatment of the initial fever or relapse, be kept under anti-relapse quinine prophylaxis for about two or three months, or more if further relapses occur. In fact this is simply a return to the old clinical practice fairly universal throughout the tropics, and is like the treatment laid down in the War Office Provisional Instructions for the Treatment of Malaria [241/General Number/15500 (A.M.D.2) War Office, August, 1917].

Two other points may be mentioned. As a result of all these observations I am not at all sure that quinine acts at all as a direct poison to the parasites, but am inclined to suggest, though merely as a working hypothesis, that the drug only stimulates some natural antibody which destroys the parasites. The second point is that, as was suggested long ago, the parasites may be much influenced by season—that is, that relapses may be much more frequent and more difficult to cure at certain seasons than at others. We hope to have more evidence on this point later on.

Regarding black-water fever, Staff Sergeant Nierenstein has made the important discovery that in certain individuals quinine may be changed into a highly hæmolytic substance which he calls hæmoquinic acid, and which is found in large quantity in black-water urine (see *Journal of the R.A.M.C.*, March, 1919).

Regarding the prevention of malaria, there has been a very general consensus of opinion that the administration of quinine, even in doses of 20 grains daily, to healthy persons with a view to preventing their becoming infected, has been very largely a failure. Many medical officers think also that this so-called quinine prophylaxis renders infections more difficult to treat when they occur. I am very sorry for this, as hitherto quinine prophylaxis has been generally adopted as one of the great weapons against the disease. Probably its previous acceptance was due to a confusion between true quinine prophylaxis, that is, quinine given to healthy persons, and anti-relapse quinine prophylaxis, that is, quinine given to infected persons for the purpose of preventing relapses. The former appears to be inefficient, the latter to be most efficient; and I suspect that the good result so often claimed for quinine in the reduction of the malaria rate of localities was due to the latter and not to the former.

If the failure of true quinine prophylaxis is finally accepted, a great change must be made in the prophylaxis of malaria in general, and we shall have to rely more than ever on mosquito reduction and mechanical protection. I will conclude by mentioning the admirable results obtained by Colonel Robertson, C.M.G., C.I.E., I.M.S., at Taranto. Last year only one case occurred in that camp owing to the careful mosquito reduction adopted by him and the officers of the camp.—(*British Medical Journal*.)

INFANT FEEDING.

THE Paris correspondent of the Medical Press writes as follows regarding this important subject:

Professor Marfan has recently raised the question as to the utility of adding such substances as sodium chloride, bicarbonate of soda, lime-water, and citrate of soda to the milk given to young infants with the object of rendering it more digestible. Certain authorities advise the addition of sodium chloride on the ground that analyses have shown that cow's milk contains a smaller proportion of this substance than woman's milk. These analyses are, perhaps, not as demonstrative as they are assumed to be. On the other hand, breeders are said to add salt to the food of the cattle in order to increase their weight, and it seems Drs. Mery, Nobercourt, and Vitry have obtained the same results in children. This increase of weight, however, is due to artificial hydration, which, if metabolism be defective, may go as far as the production of œdema. In any case, this practice is not free from inconveniences, and the increase of weight does not persist very long.

According to Professor Marfan's experience, when a child is in good health, the addition of salt to diluted and sweetened milk is not necessary. Sodium chloride presents, however, a stimulating action on the secretion of the gastric juice, and Marfan sometimes prescribes its use in certain cases of gastric trouble, such as anorexia, constipation, and diarrhoea due to dyspepsia (the stools being only slightly watery, with a good deal of whitish clots). In such cases he adds salt to the milk, but never prescribes more than fifty centigrammes per litre of diluted milk.

Cow's milk having been found to be less alkaline than woman's milk, certain medical men have advised the addition of bicarbonate of soda or lime-water. The latter does not seem to be of any utility, and neither is the former as long as the child is in good health; but owing to its eupeptic action bicarbonate of soda may be used when there is gastric dyspepsia, with a tendency to

vomiting. In this case it is best to make use of an alkaline mineral water, such as Vichy, but one should make sure that it has not been bottled too long, for then it is apt to deteriorate.

The addition of citrate of soda seems to be advantageous, for it renders the coagulum softer, more fluid, and more digestible. Poynton and Mann systematically advise the addition to the milk given to infants, even when the latter are quite healthy and free from all dyspeptic trouble. Professor Marfan has not adopted this practice, and reserves its use only when there is gastric disturbance. Citrate of soda possesses a marked antiemetic action, and is also useful in cases of dyspeptic diarrhoea.

The dose to be employed is 20 centigrammes for 160 grammes of milk. To 120 grammes (*i.e.*, roughly four ounces) of milk one should add 1 tablespoonful of a solution of 5 or 6 grammes of citrate of soda in 300 grammes of water. The addition should be made immediately before the feed, after the milk has been sterilised.

THE NATURE OF RABIES.

WE are indebted to the current issue of the *British Medical Journal* for the following article on the "Nature of Rabies." Many of our readers will probably have seen it already: a large number, however, may not have had the opportunity. As it sums up the present position of our knowledge of the subject in a most admirable manner, we have great pleasure in reproducing the note in our columns.

The rapid increase during the last few weeks in the number of areas in England and Wales in which cases of rabies in dogs have been verified has naturally caused much public disquietude, and some irritation among the owners of dogs, especially lap dogs, who resent the restrictions imposed by the muzzling order. Rabies is primarily an infectious disease of the carnivora, especially the dog, wolf, and jackal, but the cat may also easily be infected, and the disease has occurred from time to time as an epizootic in cattle, sheep, pigs, horses, and deer, and can, it is well known, be communicated to man. The virus has not been certainly identified, although there is ground for believing that the bodies described by Negri in the central nervous system, and known by his name, are evidence of the reaction of the protoplasm to the virus. The Negri bodies, according to Muir and Ritchie, have been found in practically 98 per cent. of cases of spontaneous rabies in dogs—the *rage des rues* of Pasteur. Captain J. A. Wilson, in his communication to the British Medical Association meeting three weeks ago, gave particulars of a minute rounded body (0.1 to 0.3 μ in diameter) obtained after filtration of material from the nervous tissues, salivary and lymphatic glands, and in some cases the stomach, of infected animals; their characters were demonstrated by him at the Lister Institute. The Negri bodies occur in all parts of the nervous system, especially in the spinal and cerebral ganglia. Rabies, in fact, appears to be primarily a disease of these nervous centres, and the characteristic symptoms would seem all to be accounted for on this hypothesis. In its rarer form in the dog, so-called dumb-rabies, paralytic symptoms predominate; they affect especially the jaw and the lower limbs, and this form is the less dangerous, since the animal cannot bite, although the infection may be conveyed to an abrasion licked by the animal. The incubation period in dogs appears to be from twenty to forty days; in man the usual period is said to be forty days, though much longer intervals have been noted. In the ordinary form in the dog—unhappily called furious rabies, for the saliva is infectious long before the outbursts of fury—

the first symptom is, as a rule, dullness combined with fidgets; the irritability increases and the animal tears up, and perhaps swallows, its bedding; later it appears to be subject to hallucinations, and periods of apathy are interrupted by furious paroxysms in which it will snap at anything and anybody. The muscles of the larynx and throat are affected, the bark is hoarse and emitted in a manner which is said to be characteristic. There is no fear of water, and the appetite, at any rate in the early stage, is often voracious. If the animal gets loose it will run aimlessly for long distances until it drops from exhaustion. In man also the upper respiratory passages are affected, and there is great difficulty in swallowing; the effort is attended by painful contractions of the muscles of deglutition and respiration, often followed by a tetanic state, with marked opisthotonos and temporary arrest of respiration, so that the patient eventually refuses to attempt to drink—whence the term: "hydrophobia" applied to the disease in man. The percentage of cases in which death in man follows the bite of a rabid dog has been variously stated. According to Bollinger, when the wound has not been cauterised, 83 per cent. of the persons bitten die; when it has been cauterized, 33 per cent. It is now believed, as the memorandum of the Local Government Board indicates, that the use of the actual cautery may be replaced by the free application of undiluted carbolic acid or undiluted izal or similar disinfectant. We know of no statistics which show the mortality of rabies in dogs, but there seems to be little doubt that dogs possess much less resistance to the disease than man. Pasteur, in describing his method of preventing the development of the disease in 1884, showed that the virulence of the virus when passed from the dog to the monkey and afterwards from monkey to monkey is much enfeebled, until a point is reached at which inoculation from the monkey does not give rabies to the dog. On the other hand, the virulence of the virus is increased by being passed from rabbit to rabbit, and it was upon this that Pasteur founded his treatment. The method was first tested upon the dog, and was applied to man with the more confidence because the resistance offered by human tissues to the virus was known to be much greater in man than in the dog or rabbit. After obtaining a virus of constant virulence in the rabbit, Pasteur ascertained that if a portion of the spinal cord were suspended in dry air the virulence slowly disappeared. In the earlier applications of the method to man a series of cords were used, beginning with one which had been dried for fourteen days and ending on the fourteenth or fifteenth day with one which had been dried for three days; it was found that this plan did not protect when the wound was severe and extensive, and the treatment, called intensive, now used in such wounds, extends until the twenty-first day. There appears to have been no recent thorough examination of statistics of the results of the Pasteur treatment, owing probably to the relatively small number of cases which have occurred in Western Europe in recent years. In India the disease is so much more common that the Government has established a series of Pasteur Institutes to which persons bitten by animals, chiefly dogs and jackals, proved or suspected to be rabid, are sent. In the report of the Pasteur Institute, Kasauli, for the year ending 1917, we find that 293 persons bitten or licked by animals proved to be rabid, were treated, with 6 deaths, a percentage rate of 2.05. It should be added that only 58 of these were bitten through clothing; of the others, 19 were bitten or licked on the head or face, and 216 on other parts of the body. Among 105 Europeans, 35 were bitten or licked on the head or face, and 93 on exposed parts of the body; there was only 1 death, a percentage rate of 0.95. Among 188 Indians, 14 were bitten or licked on the head or face, 123 on exposed parts of the body, and 51 were bitten through the clothing. There were 5 deaths, a percentage of 2.7.

TRANSFUSION IN DISEASES OF THE BLOOD.

PROCEEDINGS OF THE ROYAL SOCIETY OF MEDICINE.

Vol. XII, No. 5, March, 1919.

DR. LEYTON describes a multiple-syringe method of carrying out transfusions of blood. Syringes, of 20 c.c. capacity, with 10 cm. of rubber tubing attached. The capacity of the tubing was about 1 c.c. A nozzle fixed in the end of the tubing fitted the mount of the needle. Special needles with cannulæ inside were used so that, if the blood in the cannula clotted, it could be removed and a fresh one inserted. The cannula should project 0.5 mm. beyond the point of the needle. The syringes were coated with vaseline and washed out with liquid paraffin before use. The rubber tubes were filled with a solution of sodium citrate 5 per cent. and sodium chloride 0.45 per cent. This solution need not necessarily be mixed with the blood in the syringe. It floats on top and fills the rubber tubing after all the blood has been injected. Twenty to thirty syringefuls may be injected at a time.

With regard to the selection of a donor, he should be of the same group as the recipient if possible. The surgical practice is to use donors of group 4 only because their red cells will not be agglutinated by the serum of any recipient. This practice might possibly be followed in diseases of the blood. The blood of a close relative may possess certain advantages, but the writer prefers a donor who is unacquainted with the patient, to prevent the donor falsely asserting he is quite well in order to supply further blood to a friend or relative.

The donor should be given a cup of coffee shortly before transfusion.

The patient should have only light food six hours before and should be given a small injection of morphine and hyoscine half an hour before transfusion.

He concludes:—

(1) In the majority of cases the symptoms are alleviated by the transfusions.

(2) In some cases a series of transfusions at short intervals led to the blood becoming normal for a time.

(3) Perhaps in a small percentage of cases life can be maintained indefinitely by supplying the blood at the rate it is destroyed.

(4) In many cases disease is progressive, and this in spite of giving transfusions. The blood picture becomes worse and worse and death is only postponed for a short time.

DISCUSSION ON SPINAL ANÆSTHESIA.

1. DR. FELIX ROOD gives his experience of 8,000 cases with two deaths—one due to asphyxia

from stercoraceous vomiting, the other to circulatory failure in a case of gangrenous intussusception in a child of four years.

He prefers stovaine (5 per cent. with 5 per cent. dextrose) to novocain on account of the greater muscular relaxation produced. A dextrin-stovaine solution, being less diffusible, is best for children. Stovaine in saline is not so good as it diffuses about 10-in. upwards from the point of injection, irrespective of the position of the patient, and the extent of the anæsthesia cannot be controlled as efficiently as with the denser glucose solution.

With regard to the position of the patient during and after injection, he states that stovaine becomes fixed in from 3 to 5 minutes. So the patient's head and cervical region must be kept raised for the first few minutes and then he may be allowed to lie quite flat. In this way the tendency to syncope is reduced.

Spinal anæsthesia alone is deprecated. For severe operations, such as a Kraske's excision, general anæsthesia should be induced with ether-stovaine then injected, and a few whiffs of ether given occasionally thereafter to keep the patient unconscious. For operations of a less severe type, such as hernia or appendectomy, scopolamine and morphine are administered in the ward an hour before the operation. The effect of the "twilight sleep" drug may be enhanced, as suggested by Mr. Cole, by plugging the ears with cotton wool and covering the eyes with a bandage to exclude partially the stimuli of light and sound.

The complications met with were three in number:—

(1) Interference with the respiration, owing to the stovaine reaching too high a level.

(2) Complications due to fall of general blood-pressure, syncope, etc.

(3) Vomiting.

Difficulties due to stovaine reaching too high a level were rare, generally occurring in children; and were quickly relieved by artificial respiration and oxygen.

The majority of complications were due to a fall of blood pressure, varying from slight pallor to a severe syncopal attack. They occurred chiefly in the day, when the patient was propped up. Raising the legs and putting pressure on the abdomen was usually successful in causing recovery.

Vomiting seemed to depend on the height of the anæsthesia and was common when the dorsal cord was involved. The measures given above for raising the general blood pressure usually give relief.

The sequelæ noted were as follows:—

Headache: Not very common but sometimes severe. In one or two cases lumbar puncture gave instantaneous relief.

Vomiting: Very rare.

Pulmonary complications: Much less common than with other methods.

Permanent muscular paralysis, abolition of sensation and trophic lesions: Three cases only of paralysis of the external rectus muscle of the eyeball, producing diplopia, were noted. The permanent palsies reported by others were probably due to some error in technique, and usually occurred when the injection was given too low down (the writer prefers the space between the 11th and 12th dorsal vertebræ).

The operations in which spinal anæsthesia is specially indicated are: operations such as amputation for diabetic gangrene, operations of emergency which cannot be done under local anæsthesia in patients suffering from acute respiratory diseases; operations for acute or chronic septic conditions with considerable toxæmia, such as acute appendicitis or osteomyelitis; and long surgical operations likely to be associated with much shock. To these should be added operations where complete muscular relaxation is of paramount importance; such as the radical cure of large and irreducible hernia, prostatectomy, etc.

The contra-indications may be summed up by saying that spinal anæsthesia should never be administered to patients who are likely from their condition to be seriously affected by a fall of blood pressure and, therefore, never to patients who are actually suffering from shock at the time. For similar reasons it is contra-indicated in forms of heart disease, such as aortic conditions, which predispose to syncope.

2. Mr. J. P. Lockhart-Mummery is of opinion that the best combination is spinal or regional anæsthesia and morphia and scopolamine or, where the latter is contra-indicated, gas and oxygen, or all three. He emphasises the absence of vomiting and the complete protection of the patient against impulses from the field of operation.

3. Mr. Percival P. Cole favours the use of the sodium chloride solution, which allows the patient to be placed in the Trendelenburg position at once; and states that the feet should always be kept higher than the head both during and after operation.

4. Dr. F. E. Shipway states that the specific gravity of the stovaine-glucose solution is 1023, and that of stovaine-saline 1083. He attributes the fall of blood pressure to the impairment of thoracic breathing and loss of tone in the abdominal muscles, and muscles of the trunk below the diaphragm, which normally play a large part in maintaining the blood pressure. He recommends frequent blood pressure readings as an aid to selection of suitable cases.

HYPERTROPHIC PYLORIC STENOSIS IN INFANTS.

Whilst a certain number of cases presenting the typical clinical picture of this condition may be cured

by medical treatment, many cases will succumb unless surgical measures are adopted. Green and Sidbury (*Surg., Gynec., and Obstet.*, February 1919, p. 159) report five successful cases in which the Rammstedt operation was performed. This operation, which was described in 1913, consists in dividing the pyloric muscle fibres down to the mucous membrane, and partially separating the muscle ring from the mucosa, allowing the latter to bulge up into the wound.

The advantages of the operation are the speed with which it can be accomplished and the absence of shock. The one danger in the operation is wounding of the mucosa, especially that of the first part of the duodenum. This is best avoided by taking care that the stomach is emptied of air—so often sucked into the stomach by young infants during anæsthesia—by passing a stomach tube before cutting the pyloric muscle. When the muscle is cut, the mucosa should be separated from the stomach side towards the duodenum. If any visible puncture of the mucosa is made, it should be immediately closed with a purse-string suture of fine silk. To ensure that no puncture has been missed, it is well to inflate the stomach gently through the stomach tube so that any aperture may be revealed.

The whole operation can be done in from ten to fifteen minutes with less exposure, handling, and trauma than either gastro-enterostomy or any stretching operation. Careful post-operative medical treatment is essential. Feeding with breast milk may be begun two hours after operation, and continued every three hours thereafter.—(*Edinburgh Medical Journal*, May 1919.)

PROGNOSIS IN CARDIAC DISEASE.

P. D. White (*Amer. Journ. Med. Sci.*, January 1919) deals with the subject of prognosis in heart disease in relation to auricular fibrillation and alternation of the pulse. Three series of cardiac cases were collected. The first was composed of cases with auricular fibrillation; the second, of cases with alternation of the pulse; and the third, of cases with normal cardiac rhythm without alternation. Heart-block, auricular flutter, and paroxysmal tachycardia were not included *per se*.

rhythm were not subdivided. Three years after beginning to collect these series of cases, and two years after finding the most recent case, White determined their condition. The results of this investigation are shown in the accompanying table. About one-third of the patients were lost sight of.

These figures show that pulsus alternans taken *in toto* gives a much poorer prognosis than auricular fibrillation, but that auricular fibrillation as such adds little, if anything, to the gravity of prognosis in a case of heart disease. The higher grades of pulsus alternans are almost twice as grave as the slight degrees, *i.e.*, slight alternation following premature contractions, while between the two severe grades—constant alternation and marked alternation after premature contractions—there is little to choose, the mortality in such grades together being 94 per cent. within a period of three years. Even the cases with slight alternation after premature beats have a mortality of over 50 per cent. within the three years, and definitely higher than either the auricular fibrillation or the normal rhythm averages.

In the case of auricular fibrillation, White endeavoured to pick out the more serious cases from the electrocardiograms. He noted that patients who show auricular fibrillation complicated by aberrant ventricular complexes or by ectopic ventricular contractions have a much graver prognosis than the uncomplicated auricular fibrillation—much more than twice as grave, especially in the case of the aberrant ventricular complexes, where in his small group of five cases the mortality was 100 per cent. within three years. This finding might be expected, because the electrocardiograms indicate serious myocardial damage or irritability in the ventricles. Such diseased or hyper-irritable ventricular muscle does not stand up under the strain of auricular fibrillation as relatively healthy ventricular muscle does. These two conditions, according to White, probably have the same prognostic significance as pulsus alternans in the case of a nonfibrillating heart. One of the patients tabulated above as having aberrant ventricular complexes and auricular fibrilla-

Condition.	Type.	Total.	Cases followed until present time.	Better.	Un-changed.	Worse.	Dead.	Per cent. dead of cases traced.
Alternation of the pulse ...	Constant ...	26	22	2	0	0	20	91.0
	Marked after premature beats ...	16	12	0	0	0	12	100.0
	Slight after premature beats ...	58	42	4	13	1	24	57.0
	Total of alternation ...	100	76	6	13	1	56	74.0
Auricular fibrillation	Cases electro-cardiographed ...	69	...	...	...	...	...	...
	(1) Aberrant ventricular complexes ...	5	4	0	0	0	4	100.0
	(2) With ectopic beats ...	11	7	1	1	0	5	71.0
	(3) Uncomplicated ...	53	35	2	18	4	11	31.0
	Cases not electro-cardiographed ...	31	16	2	3	1	10	62.5
	Total of auricular fibrillation ...	100	62	5	22	5	30	48.0
Normal rhythm ...	No alternation, fibrillation, paroxysmal tachycardia, flutter or heart-block ...	100	49	8	15	3	23	47.0

For study as to prognosis, the groups of auricular fibrillation and pulsus alternans were subdivided, each into three classes. The patients with auricular fibrillation were subdivided into (a) those who showed aberrant ventricular complexes, the so-called "bundle branch block"; (b) those who showed ectopic ventricular contractions; and (c) those who had uncomplicated auricular fibrillation. The patients with alternation of the pulse were also subdivided into (a) those who had constant pulsus alternans; (b) those having marked alternation after premature contractions only; and (c) those showing only slight alternation after premature contractions. Patients with pulsus alternans had radial pulse-tracings taken. The 1,000 patients with normal

tion combined had been seen by him before the heart became arrhythmic. A radial pulse-tracing at that time showed pulsus alternans. The two main conclusions drawn by White are that the higher grades of alternation of the pulse carry with them an especially high mortality—nearly 100 per cent. in three years—and that cases with auricular fibrillation complicated by aberrant ventricular complexes seem to be very fatal (100 per cent in his series). Those cases with ectopic ventricular contractions complicating the fibrillation have a mortality almost as high as the total of alternation, while uncomplicated auricular fibrillation has a surprisingly low mortality percentage.—(*Edinburgh Medical Journal*, May, 1919.)

A SIMPLE CITRATE METHOD FOR BLOOD TRANSFUSION.

[*British Medical Journal*, April 5th, 1919; page 403. (Charles & Shadden.)]

THE blood was drawn from the donor by a short curved glass cannula, or alternatively by a wide hollow needle, and the flow directed into a sterile graduated measure containing 5 per cent. citrate solution, in the proportion of 2 ounces for a pint of blood (about 0.5 per cent.). The blood and citrate solution should be well mixed by stirring or agitation of the contents of the vessel. It was not found necessary to line either cannula or needle with paraffin. If a hollow needle be used, the internal diameter should be from 2 to 2.5 mm. and the length about 4 cm. During the withdrawal of blood a pressure of about 50 mm. of mercury should be maintained on the donor's upper arm by means of a blood-pressure armlet.

The citrated blood is kept at a temperature of about 40°C. and is run into the recipient's vein by means of a simple funnel, tube, and glass cannula as used for saline infusions.

Note :—The writer of these notes has successfully used a method similar to the above. Two 20 c.c. serum syringes were used to withdraw the desired quantity of blood from the donor. The blood was received in a sterile glass flask containing sufficient 5 per cent. citrate solution to bring the final percentage of citrate in the desired volume of blood to 0.5 per cent. A needle* of wide bore which fits both syringes should be selected and fixed to the first syringe. Both syringes are washed out with a little citrate solution. The needle attached to syringe No. 1 is then inserted into the vein and the syringe allowed to fill with blood. The syringe is detached from the needle and handed to the assistant, who squirts the contents into the flask and washes the syringe once with citrate solution. Meantime the second syringe is being filled from the needle in the vein. The process is then repeated. When the desired quantity of blood has been withdrawn, it is run into the recipient's veins by means of the ordinary simple saline infusion apparatus as described above.

THE EFFECTS OF LONG CONTINUED DOSAGE WITH QUININE ON THE VISUAL APPARATUS.

[*Journal of the Royal Army Medical Corps*, Vol. XXXII, No. 4, April, 1919.]

DRS. JAMIESON and LINDSAY discuss the results of examination of the visual apparatus in 170 cases of chronic malaria, which had been under treatment by quinine for long periods.

They state that long continued treatment with quinine apparently has some effect in contracting the field of vision. Twenty-two per cent. of their cases showed some contraction, and in 13 per cent. the field was contracted up to 20 degrees. Stoppage of treatment by quinine was always followed by improvement, although some cases showed an increase in the visual field under further quinine administration.

* If available, a needle fitted with an internal cannula would be a great convenience.

None of the cases examined showed any change in the retina or optic discs.

Only one case out of 1,296 admitted complained of a loss of visual acuity, and he was a heavy smoker and had had soamine injections.

They conclude that no one need be deterred from giving moderate doses—10 to 15 grs. three times a day—of any of the preparations of quinine in common use, by the fear of causing permanent damage to the eyes; also that, when the visual field is found to be contracted, either immediately on completion of a course of quinine or during its progress, the prognosis is good.

WOUND SHOCK.

The Military Surgeon, Vol. XLIV, No. 5, May 1919, contains a lecture on the above subject by Lieut.-Col. W. B. Cannon, Medical Corps, U. S. Army.

Having described the well-known symptoms of shock, Col. Cannon proceeds to discuss the various theories put forward to account for the low blood pressure observed in this condition.

One of the oldest theories—exhaustion of the vaso-motor centre with relaxation of the arterioles—has recently been supported by Crile. The theory is based on the condition of the nerve cells taken from shocked animals and men, but the low blood pressure would in itself account for the condition of these cells.

Another theory ascribes shock to liberation of fat, which passes as emboli to the lungs, plugging the vessels and diminishing the blood flow from the right to the left heart. Against this theory are the facts that,—

1. There are no disturbances of respiration.
2. There is no backing up of blood in the right heart with distension of veins.

Henderson assumes a loss of CO₂ from the blood (acapnia) as a result of exaggerated breathing due to pain, but there is often no pain, and cases suffering from shock do not always breathe as Henderson suggests.

The writer then draws attention to the effect of the injecting the first products of proteolysis "into an animal—peptone shock"; and the peptone class of lymphagogues. He points out that injured cells and tissues undergo auto-digestion with a production of similar substances.

He quotes three experiments :—

1. The muscles of the hind leg of an animal were injured, and after about 20 minutes the blood pressure began to fall, reaching shock level in an hour or so.
2. The blood vessels of the leg were tied before injuring the muscles—clips were kept on for 35 minutes without any appearance of shock, but on removal the pressure promptly fell.
3. The nerves of the leg were cut to begin with, but this did not prevent the appearance of shock.

He concludes that shock appears to be brought about chiefly by the absorption of toxic materials from the injured tissues into the blood stream.

He also showed that the agitation of a broken bone in injured tissues caused a sharp drop in blood pressure.

The practical points to be deduced from the above considerations are :

1. The application of a tourniquet is beneficial in preventing the absorption of toxic material from a badly mangled limb.

2. If a tourniquet is left on for a long time—24 to 36 hours—and then removed, serious effects may ensue from auto-lysis of normal tissues.

3. Fractured limbs should be immobilised at once to prevent the bone moving about in injured tissues.

Shock may result not only from injuries, but also from the action of bacilli, which are proteolytic in their effects, *e.g.*, in gas gangrene.

The low blood pressure itself, by diminishing the number of trips the red blood corpuscles make between the tissues and the lungs, leads to a deficiency in the supply of oxygen to the tissues, and consequent acidosis and reduction in the CO₂ content of the plasma due to imperfect combustion of the acid products of metabolism. Indeed, there is a critical level, a little below 80 mm. of mercury, at which the supply of oxygen becomes deficient.

The measures directed toward raising the blood pressure, when the ordinary methods of rest, application of warmth, etc., fail, are as follow :—

. Blood transfusion is the best measure, because it not only increases the volume of the circulatory fluid, but also the number of oxygen carriers in the stream.

2. Normal salt solution causes only a temporary rise.

3. Glucose solution also fails.

4. Gum saline (Bayliss—6 per cent. gum acacia in 0.9 per cent sodium chloride) is better : but not as good as blood.

Other measures of use are :

1. Fluid by mouth or rectum.

2. Application of warmth ; cold has been proved by blood counts to cause stagnation of blood in the capillaries.

3. Morphia, on account of its action in diminishing oxidation.

4. The choice of a suitable anæsthetic when operations are contemplated ; chloroform and ether should be avoided, and, if used, transfusion or infusion should be started at the beginning of the operation.

The best anæsthetic is nitrous oxide and oxygen in the proportion 3 to 1. If morphia is previously administered the amount of nitrous oxide may be further reduced.

The Sir Walter Buchanan Fund.

We beg to acknowledge the following subscriptions to the above fund :—

	Rs.
Lt.-Col E. A. W. Hall, I.M.S. ...	150
Bt. Lt.-Col. F. P. Connor, I.M.S. ...	100
Dr. Ashe, Rajshahi, Bengal ...	32
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" J. Entrican, I.M.S. ...	50

CHANGE IN THE ASSOCIATE EDITOR FOR BOMBAY.

WE regret to announce that we are losing the assistance of the Hon. Major-General W. E. Jennings, I.M.S., as Associate Editor for Bombay, a position which he has held for over fifteen years, as he finds that his duties as Surgeon-General with the Government of Bombay, leave him but little leisure for extraneous activities. We are fortunate, however, in securing the assistance of Brevet Lieutenant-Colonel R. Markham Carter, C.B., I.M.S., who has kindly consented to fill the breach and carry on the duties of Associate Editor for Bombay.

Correspondence.

EXCHANGE.

"AN I.M.S. officer, of five years' service, whose civil area is Bombay Presidency, would like to hear from one whose civil area is Lower Province, for mutual transfer."

Address M.D., c/o "The Indian Medical Gazette," Box 54, Calcutta.

THE CALCUTTA EYE HOSPITAL.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—With reference to the note in the May number of the *British Journal of Ophthalmology*, on the Calcutta Eye Hospital, which I understand you are reproducing in this number of the *Gazette*, I would like to say that the picture there given is not in the least exaggerated, as everyone who knows the old hospital is aware. The operation theatre is the only decent part of it. It is a disgrace that a new one was not built long ago. It is many years since I sent in strong reports on its defects [for the forcible wording of which I expected to be reprimanded]. Probably they never reached Government, certainly not the Head of it.

It is obvious that one eye hospital for Bengal with its 45,000,000 souls is totally inadequate, as the writer of the article says. There is no reason why every large town should not have one, if the charitable rich only realised the necessity. It might be advisable to combine the treatment of diseases of the eye, ear, nose and throat in them and relieve the *sadr* hospital of such cases.

Of course the first step is to make the Presidency teaching eye hospital what it should be. Next in importance comes *post-graduate* teaching, which is urgently needed in Calcutta. Students for Pass degrees should not work at special subjects as if they were all going to be specialists. Such work should be *post-graduate*, and accompanied by thorough training, practical as well as theoretical. Enough men and women would in this way be trained in time to staff *mofassil* hospitals.

Another suggestion I would like to make is that travelling ophthalmic hospitals should be started. Over twenty years ago I translated and published in the *Indian Medical Gazette* an article by Professor Bellarmino, of Moscow, on such hospitals which were first started, and with great success, in Russia, by the late Empress. Of recent years, too, Dr. MacCallan has organised a large number of them in Egypt, affording relief and restoring sight to great numbers of people who would otherwise never have received the benefit of treatment. Travelling hospitals would be of great value in some parts of India, and need not be costly. They should travel in areas remote from *sadr* hospitals, and, needless to say, be staffed by men familiar with the language. Missionary effort has already accomplished something of the sort in India. A hospital is opened by Missionaries for a couple

of months every cold weather in Baluchistan. It is, one hears, crowded with eye patients who would otherwise not obtain any treatment.

Mashobra,
SIMLA:
31st May, 1919.

Yours, etc.,
F. P. MAYNARD,
Lt.-Colonel, I.M.S. [Retd.]

THE CALCUTTA EYE HOSPITAL.

UNDER the heading, "Annotations" the *British Journal of Ophthalmology* for May, 1919, has the following article, which will be of interest to our readers.

In the *Indian Medical Gazette* of July, 1917, Lieutenant-Colonel F. P. Maynard, of Calcutta, discussed the question of the provision of a new eye hospital for Calcutta.

The principal interest of that communication lay in the fact that the new eye hospital for Calcutta was still only in the state of being "proposed." Years ago, when the Madras Eye Hospital was still incomplete, but yet had made considerable progress towards its present condition, Colonel Maynard, the Superintendent of the Calcutta Eye Hospital wrote to the Superintendent of the Madras Hospital of his hopes of a new hospital. In those days, and probably long before, he was dissatisfied with the state of the hospital under his charge, as indeed anyone in such a position might well have been; but he was met then, and we fear, still is met, with a *non possumus*. During the war this might easily be understood, but the position was very different in the days before the war. When one reflects on the appalling loss of economic efficiency in India which results from preventable and from curable blindness, it is impossible to avoid the conclusion that the Government of Bengal has shown a want of grasp of the big problem before them in allowing so able and enthusiastic an officer as Colonel Maynard to ask so long in vain, and to wait years, for a suitable hospital to work in. The eye hospital at Calcutta has long been a disgrace to the Presidency, from the point of view of buildings and conveniences. Calcutta, with a population of 1,220,000 people, in 1910, is the second largest city in the British Empire, and it is the Capital of the Bengal Presidency, which numbers 45,000,000 souls. It has one eye hospital, and that one, despite the excellence and zeal of its staff, is inefficient to a degree! To pass over everything else for the time being, let us consider Maynard's last paragraph: "It is hoped in time to collect a good museum—the material is enormous and at present runs mostly to waste—and with the help of a pathologist and registrar to carry on research work into the pathology of the eye as affected by tropical diseases". The italics are ours. Side by side with this we may place the unedifying spectacle of a comparatively subordinate Indian civilian trying, during his furlough in England, to raise the means to institute a campaign against blindness in India. One uses the word unedifying, not in detraction of the excellent work which that very able, and far-seeing civilian, Mr. Henderson, is trying to inaugurate, but in comment upon the fact that the inactivity of those responsible should have made such a state of things possible. No one who has not worked in India can form a conception of the enormous amount of preventable and curable blindness that is laying its shadow over the health, happiness and usefulness of this great portion of our Empire. The facts are incontrovertible. They have been brought to the notice of the different Governments: and yet comparatively little has been done. Some of the responsible administrators appear to suppose that the medical officers, when they bring these matters forward, are riding hobbies, or are striving to advance their own interests under cover of Government service. What is wanted is a larger conception of the situation and a more statesmanlike method of dealing with it. Were the question seen as it really is, even the war would not have been allowed to stand in the way of energetic action being undertaken, not merely in Calcutta, but in many other parts of India, which would remove the stain of insufficient hospital accommodation for dealing with eye diseases. According to the latest Census, there are 600,000 totally blind persons in India. This does not include the partially blind or those going blind. Much of this blindness is preventable; much is curable. The very first means for fighting this scourge is so to equip the few big hospitals at the educational centres that the medical men turned out from them shall have an opportunity, and, indeed, the best possible opportunity, of learning all that a student can be taught of the treatment of diseases of the eye. The need is self-evident, and parsimony is worse than a mistake; it is a sin against responsibility.

MICA FLAKES AS SUBSTITUTE FOR GLASS COVER-SLIPS.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—Of late I have been using flakes of mica as a substitute for glass cover-slips for microscopical and microspectroscopic work in this laboratory and find them very convenient,

and in view of the present cost of glass and the number of cover-slips broken during the routine of a laboratory, more especially during cleaning by unskilled persons, I have thought it worth bringing to notice.

All that it is necessary to do is to obtain a piece of ordinary, transparent mica, separate it into thin flakes with the fingers, next cut the pieces to the requisite size with a pair of scissors, and the cover-slips are then ready for use.

They present the following advantages:—

- (1) Extreme cheapness.
- (2) They do not require to be cleaned before use.
- (3) They are not fragile.
- (4) They can be thrown away after being used once—a great advantage in medico-legal work.
- (5) For all ordinary purposes they are practically as transparent as glass.

For these reasons I think they would prove useful in hospitals for routine analyses, e.g., microscopical examination of urine, etc., and especially for students' laboratory work.

Yours, etc.,
Serological Laboratory, R. B. LLOYD, B.A., M.B.,
CALCUTTA: Captain, I.M.S.,
27th June, 1919. Mfg. Imperial Serologist, Calcutta.

EMETINE INJECTIONS IN SPRUE.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—Last year I successfully treated four cases of sprue—one male and three female, adults—by hypodermic injections of emetine (one-third grain).

Each patient showed a decided improvement after the first six injections, given every fourth day; while another six injections were given, every tenth day, as a precaution against a relapse. None required more than a dozen injections. All other medicinal treatment was entirely stopped during the course of injections.

I wish my professional readers would give it more extensive trial and relate their experience.

Yours, etc.,
KESHAVLAL J. DHOLAKIA, L.M. & S.
BHUJ (GUJAR):
17th June, 1919.

"HYPNOTISM."

To The Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—I shall be much obliged if any readers of the *Gazette* will kindly give, through its medium, references to the original researches regarding the following statement contained in Lyon's *Medical Jurisprudence*, 4th Ed., p. 320:—

"Hypnotism or Mesmerism . . . trance may be induced by administering a dose of formaldehyde, and then waving a candle before the eyes of the person seated in a chair", etc.

CHINSURAH
5th June, 1919. Yours, etc.,
J. C. DEY, M.B.,
Captain, I.M.S.

A COMPLETE TRANSPOSITION OF THE VISCERA.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—On May 24, 1919, I had occasion to perform an autopsy on the body of one Gopal Mondal, a Hindu lad, aged about 14 years, who had met his death by decapitation at the hands of a brother.

I was extremely interested on opening the body to find an absolutely complete case of transposition of the viscera and structures in both the thorax and the abdomen. The apex of the heart occupied a point on the right side of the thorax corresponding to the normal position on the left. The arch of the aorta curved to the right and the innominate artery was directed to the left side of the neck. The spleen, the descending colon, and the sigmoid flexure were placed on the right side of the abdomen, whilst the liver, the ascending colon, the cæcum and the appendix were on the left side. Similarly, all the vascular and other structures were transposed as completely as possible. The lad appeared a healthy subject and no condition of disease was found to be present in his organs and tissues.

I do not mind admitting that this was the first case of such transposition of the viscera that had come to my notice in nearly a quarter of a century of practice and in the course of examining more bodies *post mortem* than falls to the lot of most medical men.

Yours, etc.,
O. ST. JOHN MOSES, M.D., F.R.C.S.,
BERHAMPORE COURT: Major, I.M.S.,
20th June, 1919. Civil Surgeon, Murshidabad.

"WORMS."

To The Editor of THE INDIAN MEDICAL GAZETTE.

SIR.—I shall deem it a great favour if you will kindly allow me a little space in your well-known journal for the following few lines with a view to draw the attention of your numerous readers to the subject.

During the last two years of a practice attending over 20 years I have come across a series of cases suffering from a peculiar kind of worm which fly within a few seconds of their expulsion from the intestines with stools.

Children of 4 to 5 years of age are the victims, especially the boys.

The worm resembles the insect found within mangoes growing in this part of East Bengal. I have collected a few of them in a small phial of spirit and could send them to you if you desire to examine them microscopically.

I have consulted many authors on the subject and specially "The Intestinal Worms," a small but comprehensive treatise published by the Government, and in none of them is there mention of this kind of worm. I would therefore hope some light will be thrown upon the subject through the medium of your journal.

Yours, etc.,

Barhamgunj P. O., AKSHAY CHANDRA DEY, L.M.P.
FARIDPUR :
12th June, 1919.

PUNJAB LUNATIC ASYLUM.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR.—I enclose, in original, a letter from one of my patients, a hypochondriac, which you may care to reproduce in the *Gazette*. It sounds like a reminiscence from the Ayurvedic system of medicine.

Yours, etc.,

LAHORE : JAS. F. FLEMING,
3rd June, 1919. *Supdt., Punjab Lunatic Asylum.*

"SIR.—I desire to inform you that I don't think I have got a stricture I had this feeling in the Hospital which was due to Lignor Arsenicalis causing Hernia which will not allow me to pass urine freely and an operation is absolutely necessary which can be performed by Dr.

There are no signs of Syphilis on the body but the mercury has caused Hypochondriasis as the food sticks in the upper intestines and does not pass freely to the lower intestines causing a cold in the stomach and I fear I am getting an abscess in the rectum as there is a burning sensation from the anus which is due to the excess of bile causing Dyspepsia with Hypochondriasis recently taken place. I beg your merciful and kind sympathy to have me so kindly admitted in the Hospital where the operation can be performed very easily before I get any ways serious for which act of your charitableness and kindness since you have been so good and kind as an Inmate of the Asylum and pray that God will shower his blessing on you and your family."

31st May, 1919.

Service Notes.

INDIAN MEDICAL SERVICE.

ANNUAL DINNER HELD AT
THE TROCADERO,

WEDNESDAY, JUNE 11TH, 1919, 8 P.M.

CHAIRMAN:

COLONEL SIR P. J. FREYER, K.C.B.

GUESTS:

THE RIGHT HONOURABLE E. S. MONTAGU, M.P., *Principal Secretary of State for India.*

LIEUT. GENERAL SIR H. V. COX, K.C.B., *Military Secretary, India Office.*

SIR NORMAN MOORE, BART., *President of the Royal College of Physicians of London.*

DR. JAMES NEAL, *Medical Secretary, British Medical Association.*

AUSTIN LOW, ESQ.

THE EDITOR, "The Lancet."

THE EDITOR, "The British Medical Journal."

Invited but unable to be present :

SIR G. H. MAKINS, G.C.M.G., *President of the Royal College of Surgeons of England.*

SIR T. CLIFFORD ALBUTT, K.C.B., *President of the British Medical Association.*

MEMBERS:

Major-Generals.

Charles, Sir R. Havelock,
G.C.V.O.
Grainger, T., O.B.
Harris, G. F. A., C.S.I.

Colonels.

Carr-Calithrop, C. W.
Dennys, G. W. P., C.I.E.
Hughes, D. E.
Irvine, G. B., C.B.
Little, C. C.
Pratt, J. J.

Lieut.-Colonels.

Alcock, A., C.I.E.
Alpin, W. G. P.
Anderson, J., C.I.E.
Baines, F. E.
Bedford, Sir C. H., K.L.
Buchanan, Sir W., K.C.I.E.
Bull, G. H.
Burke, W. H.
Calvert, J. T., C.I.E.
Crawford, D. G.
Elliot, R. H.
Henderson, S. H.
Hudson, C. T., C.M.G.
Hulbert, J. G.
James, S. P.
Johnson, E. R.
Lewtas, J.

Lieut.-Colonels.

Liston, W. Glen.
Meyer, C. H. L.
Mulroney, T. R.
Newman, E. A. R., C.I.E.
Nott, A. H.
Novis, T. S.
Peck, E. S.
Rait, J. W. F.
Street, A.
Sweeney, T. H., C.M.G.
Symons, T. H., O.B.E.
Waters, G.
Yonnan, A. C.
Young, E. W.

Majors.

Hume, N. H.
Justice, W. A.
Maconachie, G. W.
Shand, J. G. B.
Thomson, C.
Whita, F. Norman, C.I.E.
Wright, R. E.

Captains.

Anderson, L. A. P.
Jolly, G. G.
Martin, R. V.
Martin, J. S. S.
Spackman, W. C.
Stevenson, F.

It was a most successful dinner. Sir Peter Freyer, K.C.B., presided and associated the Service with the name of the chief guest, the Right Hon. Mr. E. S. Montagu, Secretary of State. Sir Peter referred to the great history of the Service and its long record, and as regards the present gave full thanks to Mr. Montagu and Sir Havelock Charles, C.G.B.E., K.C.V.O., Medical Adviser to the India Office. In reply, Mr. Montagu referred to his strong belief in the necessity of the Indian Medical Service as a "pivotal" service and to the need of making it contented and in full enjoyment of all its old privileges as regards private practice, etc. Mr. Montagu was quite enthusiastic as to the need of a strong, united and contented Service, and mentioned that he had just received the Report of the recent Medical Services Committee. Sir Havelock Charles then proposed the health of the men responsible for the dinner—Lieutenant-Colonel J. Anderson and Colonel J. J. Pratt. In response to a call, Lieutenant-Colonel R. H. Elliot referred to the great help given to the improvement of the Indian Medical Service by Sir Havelock Charles and the British Medical Association.

BIRTHDAY HONOURS.—MEDICAL.

C. S. I.

THE Hon'ble Colonel Charles MacTaggart, C.I.E., I.M.S., Inspector-General of Civil Hospitals, United Provinces.

C. I. E.

Lieutenant-Colonel William Dunbar Sutherland, I.M.S., Imperial Serologist, Calcutta.

Lieutenant-Colonel John Joseph Bourke, I.M.S., Assay Master and Officiating Mint Master, Calcutta.

Lieutenant-Colonel Richard Arthur Needham, D.S.O., I.M.S., Deputy Director-General, Indian Medical Service.

O. B. E.

Major Clayton Alexander Hingston, I.M.S., Personal Assistant to the Surgeon-General with the Government of Madras.



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G. ATHERTON & CO., 8 Clive Street, Calcutta

Dr. James Glansey Johnstone, Assistant Surgeon, Lingah, Persian Gulf.

Lieutenant-Colonel Eugene John O'Meara, I.M.S., Principal, Medical School, Agra, United Provinces.

Dr. Cecil Henry Elmes, Health Officer, Port of Calcutta, Bengal.

C. I. S. O.

Hon'y Major John Robertson Indian Medical Department, in charge of His Excellency the Viceroy's Dispensary.

KAISAR-I-HIND.

First Class.

Lieutenant-Colonel Richard Henderson Castor, I.M.S., Civil Surgeon, Moulmein, Burma.

Dr. Hugh Gordon Roberts, Civil Surgeon, Shillong, Assam.

Second Class.

Captain Patrick Hayes, R.A.M.C., Medical Officer, Neemuch Cantonment, Central India.

Dr. Harold Edwards Flint, Medical Mission, Bengal.
Miss Zilla Edith DaCosta, Lady Doctor, in charge of the Jubilee Female Hospital, Bahawalpur, Punjab.

Miss Harriett Davies, Medical Missionary, Habiganj, Assam.

MAJORS CUTHBERT ALLAN SPRAWSON, M.D., London, I.M.S., and Frederic Percival MacKie, M.D., F.R.C.S., I.M.S., have been elected to the fellowship of the Royal College of Physicians, London.

THE names of the undermentioned officers are brought to notice for gallant and distinguished service rendered in connection with the military operations at Aden during the period from August 16, 1917 to August 31, 1918.

Lieutenant-Colonel T. H. Foulkes, F.R.C.S., I.M.S.
Major (T. Lieutenant-Colonel) Macrae, I.M., M.B., I.M.S.
T. Captain M. K. Pillai, M.B.

HONOURS AWARDED BY THE COUNCIL OF THE BRITISH MEDICAL ASSOCIATION.

The late Captain N. G. Chavasse, V.C., M.C., R.A.M.C.:
Gold Medal of the Association.

The Council has decided to present the Gold Medal of the Association to the nearest relative of the late Captain Noel Godfrey Chavasse, V.C., M.C., R.A.M.C., to whom the Victoria Cross and Bar were awarded in the following circumstances:—

"Victoria Cross.—For the most conspicuous bravery and devotion to duty. During an attack he tended the wounded in the open all day, under heavy fire, frequently in view of the enemy. During the ensuing night he searched for wounded on the ground in front of the enemy's lines for four hours. Next day he took one stretcher-bearer to the advanced trenches, and, under heavy fire, carried an urgent case for 500 yards into safety, being wounded in the side by a shell splinter during the journey. The same night he took up a party of twenty volunteers, rescued three wounded men from a shell-hole twenty-five yards from the enemy's trench, buried the bodies of two officers, and collected many identity discs, although fired on by bombs and machine-guns. Altogether he saved the lives of some twenty badly-wounded men, besides the ordinary cases which passed through his hands. His courage and self-sacrifice were beyond praise."—(London Gazette, October 26, 1916.)

"Though severely wounded early in the action whilst carrying a wounded soldier, Captain Chavasse refused to leave his post, and for two days, not only continued to perform his duties, but in addition went out repeatedly under heavy fire to search for and attend to the wounded. During these searches, although practically without food during this period, worn with fatigue, and faint with his wound, he assisted to carry in a number of badly wounded men over heavy and difficult ground. By his extraordinary energy and inspiring example he was instrumental in rescuing many wounded who would otherwise have undoubtedly succumbed. This devoted and gallant officer subsequently died of his wounds."—(London Gazette, September 14, 1917.)

Major Arthur Martin Leake, V.C., F.R.C.S., R.A.M.C.: the Gold Medal of the Association.

The Council also desires to place on record the following as to Major Arthur Martin Leake, V.C., F.R.C.S., R.A.M.C., to whom, as already intimated, the Council in 1915 awarded the Gold Medal of the Association:—

"Victoria Cross.—For great devotion to duty and self-sacrifice at Vlakfontein, February 8, 1902, when he went out into the firing line to dress a wounded man under very heavy fire from about forty Boers only 100 yards off. When he had done all he could for him, he went over to a badly wounded officer, and while trying to place him in a more comfortable position he was shot three times. He only gave

up when thoroughly exhausted, and then he refused water until other wounded men had been served."—(London Gazette, May 13, 1902.)

"Bar to Victoria Cross.—For most conspicuous bravery and devotion to duty throughout the campaign, especially during the period October 29 to November 8, 1914, near Zonnebake, in rescuing, whilst exposed to constant fire, a large number of the wounded who were lying close to the enemy's trenches."—(London Gazette, February 1915.)

The presentation of both medals will be made, it is hoped, at the Annual Meeting at Cambridge in 1920.

LIEUTENANT-COLONEL SIR DAVID PRAIN, F.R.S., I.M.S., has been appointed chairman, and Lieutenant-General Sir Alfred Keogh, G.C.B., and Sir Malcolm Morris, K.C.V.O., members of a committee set up by the President of the Board of Agriculture to inquire into the steps that should be taken to render the work of the Royal Botanic Society of London as useful as possible from the scientific and educational point of view.

THE names of the undermentioned officers are to be added to those brought to notice for distinguished and gallant services and devotion to duty by Lieutenant-General Sir W. R. Marshall, K.C.B., K.C.S.I., Commanding-in-Chief, Mesopotamian Expeditionary Force, in his despatch of November 11, 1918. (Published in the Supplement of the London Gazette, February 21, 1919, No. 31195.)

Lieutenant Colonel W. B. Lane, C.I.E., Indian Medical Service.

Captain R. A. Chambers, M.B., I.M.S.

CENTRAL CHANCERY OF THE ORDERS OF KNIGHTHOOD.

THE King has been graciously pleased to make the following promotions in, and appointments to, the Most Eminent Order of the Indian Empire, in recognition of the meritorious services of the undermentioned in connection with the war. To be dated 3rd June 1918:—

K. C. I. E.

Lieutenant-General Thomas Joseph O'Donnel, C.B., D.S.O., R.A.M.C., Director of Medical Services, India.

C. I. E.

Colonel Herbert James Barratt, R.A.M.C. (retired), Assistant Director of Medical Services, Meerut Division.
Colonel Samuel Cavell Philson, R.A.M.C. (retired), Assistant Director of Medical Services, Karachi Brigade.

B. E.

Major Albert Elijah Walter, Indian Medical Service.

HIS Excellency the Viceroy and Governor-General is pleased to announce that His Imperial Majesty the King, Emperor of India has been graciously pleased to award the Kaisar-i-Hind Medal of the First Class for Public Service, in India to:—

Dr. Hugh Gordon Roberts, Officiating Civil Surgeon, Shillong, Assam

THE King has been graciously pleased to command, on the recommendation of the Secretary of State for War, that the following appointments to, and promotions in, the Order of the British Empire which were published in the London Gazette on the dates stated, shall be transferred to the Military Division of the order, in terms of the notification published in London Gazette of December 27, 1918, No. 31084:—

Commander: Molesworth, Colonel William, C.I.E., M.B., V.H.S., I.M.S., December 19, 1918.

Officers.

Major Samuel Richard, Christophers, C.I.E., M.B., I.M.S., November 18, 1918.

Major Frederick Percival MacKie, M.D., F.R.C.S., I.M.S., November 18, 1918.

Lieutenant-Colonel Ernest Reinhold, Rost, I.M.S., November 18, 1918.

Major Charles Edward Southon, M.B., I.M.S., November 18, 1918.

Major Albert Elijah, Walter, Indian Medical Service, December 19, 1918.

INDIAN MEDICAL SERVICE.

THE undermentioned officers are granted, subject to His Majesty's approval, the acting rank of Colonel while holding the appointments mentioned, against their names with effect from the dates, or for the periods specified:—

Major (Brevet Lieutenant Colonel) G. Browne, Assistant Director of Medical Services, 3rd (Lahore) Division, 16th January, 1917.

Lieutenant Colonel W. W. ... Director of Force, 9th January, 1919.

Lieutenant Colonel (Brevet Colonel) A. J. Macnab, Assistant Director of Medical Services, Base, from 11th June, 1915, to 2nd January, 1916; Assistant Director of Medical Service, 2nd Indian Cavalry Division, from 6th January, 1916, to 3rd May, 1918; Assistant Director of Medical Services, 5th Cavalry Division, Egyptian Expeditionary Force, from 9th June, 1918, to 28th January, 1919; Deputy Director of Medical Services, Desert Mounted Corps, 29th January, 1919.

Lieutenant-Colonel H. J. K. Bamfield, Assistant Director of Medical Services, Base, from 26th August, 1916, to 3rd March, 1918, Assistant Director of Medical Services, 5th Cavalry Division, Egyptian Expeditionary Force, 1st February, 1919.

THE undermentioned officers are granted, subject to His Majesty's approval, the acting rank of Lieutenant-Colonel while commanding the Medical units mentioned against their names, with effect from the dates, or for the periods specified:—

Major J. W. Illius, No. 162 Indian Field Ambulance, 1st October, 1918.

Major H. M. Inman, No. 139 Indian Field Ambulance, 24th December, 1918.

Major R. H. Price, No. 110 Indian Field Ambulance, from 19th November, 1914, to 28th July, 1916.

Major C. A. Godson, No. 154 Indian Combined Field Ambulance, 1st April, 1918.

Major J. J. Urwin, Sialkote Cavalry Field Ambulance, from 9th February, 1916, to 8th May, 1918, and No. 32 Combined Clearing Hospital, from 9th May, 1918, to 27th January, 1919.

Captain H. R. B. Gibson, No. 51 Indian Casualty Clearing Station, 1st September, 1916.

Major A. S. M. Peebles, No. 169 Indian Field Ambulance, 4th January, 1919.

Major J. C. H. Leicester, No. 130 Indian Combined Field Ambulance, from 19th July, 1916, to 6th May, 1918; No. 33 Combined Clearing Hospital, from 7th May, 1918, to 5th June, 1918, and No. 44 Indian General Hospital, from 6th June, 1918, to 27th July, 1918.

Major H. M. Brown, No. 58 Combined General Hospital, 5th November, 1918.

Major J. McA. MacMillan, No. 123 Combined Field Ambulance, 6th February, 1917.

Major G. A. Jolly, No. 28 Indian Casualty Clearing Station, 28th September, 1918.

IN Army Department Notification No. 2946, dated the 20th December, 1918, against the name of Major T. R. Kelly, for "18th November, 1914, to 24th May, 1916," read "18th December, 1914, to 27th January, 1917."

ARMY Department Notification No. 2482, dated the 25th October, 1918, is cancelled in so far as it relates to Major J. J. Urwin and J. McA. Macmillan, Indian Medical Service.

Staff.

MAJOR-GENERAL SIR C. H. BURTCHAELL, R.C.B., C.M.G., M.B., K.H.S., Army Medical Service, to be Director, Medical Services in India, 7th June, 1919.

THE following appointments have been gazetted:—

Deputy Director of Medical Services.

Colonel P. Hehir, C.B., C.M.G., Indian Medical Service, 14th June, 1917.

Assistant Directors of Medical Services.

Lieutenant-Colonel J. B. Smith, Indian Medical Service, 11th May, 1917.

Colonel C. R. M. Green, Indian Medical Service, 14th May, 1917.

Colonel P. Hehir, C.B., C.M.G., Indian Medical Service, 26th May, 1917.

Lieutenant-Colonel V. E. H. Lindesay, Indian Medical Service, 13th July, 1917.

Deputy Assistant Directors of Medical Services.

Captain J. A. Sinton, V.C., Indian Medical Service, 11th May, 1917.

Major W. R. Dutton, Indian Medical Service, 13th June, 1917.

Captain P. M. Rennie, Indian Medical Service, 27th June, 1917.

CAPTAIN GANESH DAS KAPUR, I.M.S., is permitted, subject to His Majesty's approval, to resign his temporary commission on account of ill-health, with effect from the 23rd May, 1919.

INDIAN MEDICAL SERVICE.

CAPTAIN W. H. RIDDELL, M.C., in consequence of ill-health, 4th April, 1919.

LIEUTENANT-COLONEL JOSEPH GEORGE HULBERT, M.B. (retired), whose re-employment was notified in Army Department Notification No. 1149, dated the 11th February, 1916,

has been permitted to resign, with effect from the 23rd March, 1919.

MAJOR A. W. OVERBECK-WRIGHT, I.M.S., on reversion from military duty, to be sub. *pro tem.* Superintendent, Lunatic Asylum, Agra.

THE services of Captain R. B. S. Sewell, Indian Medical Service, Surgeon, Naturalist, Marine Survey of India, are placed at the disposal of the Government of India in the Education Department, for employment as Officiating Superintendent Zoological Survey of India, with effect from the date he assumes charge of his duties.

Notice.

SCIENTIFIC Articles and Notes of interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

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BOOKS, REPORTS, &c., RECEIVED:—

- Annales D'Hygiène et De Médecine Coloniales.
Diseases of the Ear in School Children: By J. K. Love, M.D. John Bright & Son, Ltd.
Elements of Human Anatomy and Physiology in Hindi, 2nd Edition, Part I. By T. N. Varma, B.Sc., M.B., B.S., Lucknow. The Theory and Practice of Massage. By Beatrice M. Goodall-Capestako. 2nd Edition. H. K. Lewis Co., London.
Ulcers of the Legs, Miscalled Varicose. R. Prosser White, M.D., M.R.C.S., Wigan.
Annual Clinical Report: Rajah Sir Ramasami Lying-in-Hospital, Madras, 1918.
Report, Registration Department of Assam, 1918.
"on Malaria, Chief Medical Officer, E. I. Railway.
"on Malarial Campaign at Kurunegala. By S. T. Gunasekara, L.M.S., Ceylon.
A Vision of the Possible: What the R. A. M. C. might become. By James W. Barrett, K.B.E., F.R.C.S.
Report of the London Missionary Society in Cuddapah.
Administration Report, Colombo Municipality, 1918. By Dr. Marshall Philip.
The Journal, Ceylon Branch. British Medical Association.
Annual Report, General Hospital, Madras, 1918.
Injuries to the Head and Neck. Lawson Whale, 1919.
Heart: Past and Present. Edgar Lea. Messrs. Baillière, Tindall and Cox, 1919.
Manual of Gynaecology. By J. C. Hirst, M.D. W. B. Saunders Co., 1919.
Clinical Microscopy and Chemistry. By F. A. McJankin, M.D. W. B. Saunders Co., 1919.
Text book of Physiology. By W. H. Howell, M.D. W. B. Saunders Co. 1918.
The Pityriasis. By W. Blair Bell. Messrs. Baillière, Tindall and Cox, 1919.
Annual Report of King George V. Anti-Tuberculosis League, Bombay, 1918.
Annual Report, Royal Botanic Gardens, Calcutta, 1918.
Report of the Malaria Advisory Board. Federated Malay States, October, 1918.
Report of the Maritime Trade of Bengal, 1918-19.
Annual Report, St. John's Ambulance Association, 1918, Indian Council.

LETTERS, COMMUNICATIONS, &c., RECEIVED FROM:—

- Lt.-Col. F. P. Maynard, I.M.S., Simla; Major C. E. Palmer, I.M.S., Dharmasala; Lt.-Col. Sir W. T. Buchanan, I.M.S., London; Lt.-Col. F. Wall, I.M.S., Bangalore; Capt. J. F. Fleming, I.M.S., Lahore; Capt. J. C. Dey, I.M.S., Chinsurah; President, All-India Sub-Assistant Surgeons' Association; Asst.-Surgn. S. S. Kündu, Nowgong, Assam; Lt.-Col. E. Hasell Wright, I.M.S., Coorg, Madras; Major M. H. Thornley, I.M.S., Cuttack; E. E. R. McDonagh, F.R.C.S., London; Dr. Hindmarsh, Muzaferpur; Capt. F. F. Strother-Smith, I.M.S.; Asst.-Surgn. Chacko, Trivendrum; Asst.-Surgn. Ashutosh Roy; Major St. John Moses, I.M.S., Berhampore; Lt.-Col. E. E. Waters, I.M.S., Howrah, Bengal; Dr. Jatindra Nath Banerjee, Doars; Capt. B. N. Mitra, I.M.S., Dinapore; Major A. N. Overbeck-Wright, Agra,

Original Articles.

MIDWIFERY IMPRESSIONS.

BY SIR JAMES R. ROBERTS, K7, C.I.E., M.B., M.S.,
F.R.C.S. (Eng.),

LT.-COL., I.M.S. (Reid.)

THE following notes may be of some use to those beginning obstetric practice in this country :—

Puerperal septicaemia.—The prevention of this complication should begin before the confinement, and not after. Doctors and nurses now-a-days are so careful and use so many precautions, that it is next to never that they are at fault. We may take it, therefore, as a useful rule, that when septicaemia occurs, it is an anti-infection on the part of the patient. There is a great difference, as we all know, between ordinary cleanliness and surgical cleanliness; I have, therefore, advocated and have used for many years boric powder. This is dusted on the vulva once a day by the patient or nurse for a few days before the labour is due. I consider that its use is especially to be taught to the *dhai* members of the Victoria Memorial Scholarships classes. It is simple in application, and in my experience very preventative of septicaemia in the practice of these midwives; moreover, in difficult cases where an obstetric operation becomes necessary, it is a great relief to the operator to know that sepsis may be ruled out of court. Among the better classes and among English women boric powder is less essential, though not unnecessary. In all cases where difficulties are anticipated from the previous history or from pelvic measurements I insist on its use previous to labour. Where a well-to-do patient is in the hands of a first-class maternity nurse, whose practice is to shave and clean the parts, it stands to reason that boric powder is less essential, but in poorer homes, I say, use it.

Douches.—At one time I tried a series of cases in a nursing home, using a douche of weak biniodide on admission and continuing with boric powder every day. I had no cause to regret this practice as I had no cases of septicaemia. I do not approve of douching with any solution, unless it be properly prepared. What results can one expect from some lysol thrown into hot water, cold water added, and used immediately it is prepared. The solution has no time to sterilise itself, it cannot be anything but dangerous. The practice should be, add lysol to boiled or very hot water, let it cool, then add hot water straight from the kettle, before use, to bring it to the proper temperature.

The use of douches after the labour is still a point under discussion, and varies in practice. The common-sense view is that, given a normal and quick labour with a good nurse in attendance, and the external parts cleaned and

sterilised, there is no use giving a douche, provided the discharges are received in some antiseptic material; but given conditions other than the above, where instruments have been used, where the labour has been prolonged, where it is anticipated clots will be retained, where the perineum has been torn, or where cystitis already exists, then I consider a well prepared douche to be essential. Again, in a hot moist tropical climate douching is more necessary than in a cold one.

Talking of cystitis complicating labour, some interesting points for consideration crop up. It is very important for the practitioner to see and examine a specimen of urine of the pregnant woman under his charge; a report from a laboratory is not necessary. The important points are the presence or absence of albumen, and the positive evidences of cystitis, as shown by mucus, pus and bacteria. If albumen be found, take the blood pressure from time to time, as a rapid rise is a danger signal of the most valuable nature. Extended practice in midwifery in India, among both Indians and Europeans, shows that coli infections of the bladders are more common than one is led to suspect. Keep this, therefore, in mind; prick up your ears when a pregnant woman complains of frequency of micturition, for you must be on your guard when the labour occurs to prevent coli septicaemia by infection of the uterus. Although this is, I think, *i.e.*, in my experience, less dangerous than streptococcal, yet it is peculiar in forming abscesses in the pelvis or lumbar region that require immediate opening. I was once called in to see a lady, fourteen days after confinement, with fever, rigors, and great pain in the left thigh; nothing was to be seen or felt in the limb. The infection was not streptococcal, I was told. I was, therefore, right in diagnosing an abscess pressing on the lumbar plexus, and an operation from the loin opened the accumulation of pus.

The greater frequency of albuminuria and eclampsia among European women in India than in Europe, should always prepare one to meet this complication. Col. Godfrey Tate, I.M.S., has pointed out to me the association of coli infection of the bladder with eclampsia as incidental rather than co-incidental and this is a point that requires investigation, as it may explain this frequency. In such cases Esbach's albuminometer, he shows, is fallacious, giving a higher percentage of albumen, as the picric acid precipitates the mucin as well as the albumen. To obviate this error it is necessary to filter off the mucus. Always, therefore, inquire for a previous history of bladder trouble. Patients with coli kidney infection are, among the educated classes, generally aware of it and tell the practitioner so. Old and seemingly cured bladder trouble is quite likely to be re-lit by labour. One patient I had, who was a paratyphoid B. carrier, *i.e.*, was passing these bacilli in the urine at the time of her confinement, passed safely through the parturium, but not without a

relapse of the fever and its dysenteric complication.

Exhaustion.—There seems to be a failure among many to recognise that exhaustion is dangerous; the greater the exhaustion the nearer is the patient to death. We must make it a golden rule never to allow a labour to be prolonged. It is criminal to sit down and wait or to put off, hoping for the best. You have some splendid resources at your command, therefore, use them. *Three to four hours* in the second stage is enough for the strongest of primiparæ. If you are called in to see a patient in whom labour has been prolonged, do not place any importance on the description given you of the frequency or insufficiency of the pains; but look carefully to all the signs and symptoms of exhaustion. I need not enumerate them here. Some highly-strung women become exhausted quicker than others. If a patient says to you "I can do no more," believe her and act accordingly, and act at once. Educated high-class women, whether European or Indian, have to pass a large-sized infant head through the pelvis, and suffer accordingly. Their labour is not for one moment to be compared to the women of Nature, to whom childbirth is merely an incident. It is prolonged pressure on the pelvic organs and tissues which is dangerous. You may expose them to considerable force in a forceps delivery, and no harm comes of it, provided no prolonged pressure has previously existed. A quick delivery means no exhaustion and a rapid recovery, a prolonged labour means exhaustion even unto death. I have seen some terrible cases in my time, so I warn others who succeed me. Fancy keeping even a primipara 24 hours, or 48 hours or even three days in labour with the excuse that the pains are not strong. This is done and continually being done; but it is not the art of modern midwifery. I consider that one should be guided by considerations such as these:—Suppose we have a head presentation, make out at least that the position is not one of occipito posterior. Directly the os has dilated, there is no necessity to delay any further. You have measured the pelvis, or you know from a previous delivery that it is of good size. Now is the time to give pituitrin hypodermically; this commences to act so quickly that it is necessary to have everything ready beforehand, especially the chloroform. With pituitrin it is possible to anæsthetise the patient more deeply, and still the pains go on. The condition is one of unconsciousness to all suffering though it is not as deep as surgical anæsthesia. If all is well the child is born in a few minutes, *i.e.*, between ten and twenty. The advantage of pituitrin is that, should it fail to act, you know of its failure in twenty minutes, and you see the pains diminishing; then is the time to put on forceps without allowing the patient to recover from chloroform. Failure of pituitrin is, therefore, a most valuable index of what to do. It stands to reason that in pituitrin deliveries, the forceps should also be prepared

beforehand, for it is a serious mistake to allow the patient to recover from the anæsthesia while the instruments are being prepared and a period of considerable pain experienced. I am afraid that a dread against pituitrin has been created, as a legacy from the ergot days, but I have never seen anything untoward happen, especially if it is managed properly, *i.e.*, the uterus emptied when it fails. The fear of a retained placenta arises, but it can be got over by following the body of the child down with one hand on the uterus, so as to dislocate the placenta, when the os is still widely open, but no time should be lost as in all midwifery manipulations. Adherent placenta are not more frequent with pituitrin than without. Moreover, if by ill-chance a placenta be retained, the effect of pituitrin soon passes off and it can be delivered, as is usual, with or without chloroform.

During the first stage of labour we have the valuable assistance of morphia and scopolamine, or heroin, to allay the pain; my experience is against the use of these according to the stereotyped practice of twilight sleep; it prolongs labour so much, and with it the attendant exhaustion, which I consider a serious danger. One or two doses of heroin during the first stage, I think, is most valuable. When the os is dilated, I say get the labour over as soon as possible, for everybody's sake.

When it is unruptured membranes that are keeping the delivery back, they must be ruptured first before pituitrin is ever thought of; such common-sense practice was usual before pituitrin days, so need not be referred to further.

I consider this drug a most valuable adjunct to midwifery practice; what strikes one is that deliveries accomplished by this means with the use of chloroform, are so much quicker, so painless, accompanied by no exhaustion, and followed by such a rapid and excellent recovery that it takes away the fear of delivery from the modern woman. Moreover, it is so valuable in preventing post-partum hæmorrhage, as the uterus contracts afterwards to perfection. Where the dread of pituitrin comes in, I do not know, except in those cases where it is not accompanied by chloroform, when the agony is intense, and forceps are not immediately used to effect delivery. The same rule applies to breech presentations.

In my experience, I think that there is a good deal of vagueness in practitioners' minds as what is a dilated os, or one not quite so. It is best to act with the ones that are not quite so, as if they were dilated, and to ask yourself the question when examining, "Can the lip of the os retract over the head?" I am not writing of a rigid os.

In applying forceps or in any intra-uterine manipulations, it is most necessary not to act in the dark, but to know exactly the position of the presenting part. Some of us have an advantage in having a small hand, so there is no excuse for lady doctors, I always think.

The perineum.—So much stress is laid in our text-books on saving the perineum, and so many instructions given to effect this end, that one doubts their efficacy; however, in practice among the upper classes, where the infant's head is large, it is of frequent occurrence for a tear to occur. "Give it time to stretch, and assist the stretching," is the line advocated. I have always assisted the perineum by support and by drawing it forward, but if it goes,—well, what of it? I have spent so much time in repairing pelvic floors due to submucous tearing of the levator ani, that I would sooner see the pelvic floor torn, and of course with it part of the perineum, than see it stretched. The one is immediately reparable, the other means creation of an invalid with pelvic trouble, until some experienced surgeon recognises that it is the pelvic floor that is at fault and requires repair. Nothing is more pitiable than to see a lady of our class transformed into a sedentary invalid with pelvic pain and discomfort, and all due to a stretched perineum, which really means a pelvic floor failing to give support. The loss too of the constrictor vaginae by stretching is a serious disability. On the whole, I say, let us tear rather than stretch, provided the attendant knows how to repair the loss of continuity. The anatomy of the parts is that the levator ani forming so important a part of the pelvic floor arises from the spine of the ischium and white line of the fascia, a portion coming forward on either side of the vagina to be attached to the ramus of the pubes. It is just that part which gets torn or stretched, and which it is important to repair at the time, or by subsequent operation. The tear passes from the perineum into the vagina, and almost invariably passes up one side of the posterior column of that canal, and ends by dividing this anterior portion of the levator. It is, therefore, most important to pick up the muscular fibres in the suture. I do not advocate any elaborate technique for this operation, such as is required to be done in subsequent days, apart from delivery. Three full-curved big needles with or without a needle-holder, and threaded with silk, is all that need be prepared. The patient is drawn across the bed in the usual gynæcological position, and the legs held by a nurse; a good light is, of course, necessary. It is quite possible to do without an assistant separating the labia, which can be done with the fingers of the left hand in an emergency. I lay great stress on the left forefinger being used to guide the needle through the deeper portions and under the tear. You cannot see, therefore, feel what you are doing. A surgeon has three eyes, two in his head and one on the tip of his finger. The upper portion of the wound is first sewn; when it is complete, run the finger up the sewing and feel that the stitches have been placed to include the deeper tissues, and that no pouch is left under the upper stitches in which discharge accumulates, and so prevents healing, for this is a disaster. The use of catgut is not to be recommended, as

uterine discharges are very digestive; the stitches are to be removed on the ninth day, therefore, it is important to use a material which will hold till then.

Maternity Homes.—It is a very great advantage to have the patient in an institution, where there is a well lit and furnished labour room, and where there is plenty of assistance in the shape of nurses. I consider that at the time of delivery two nurses are always required. It is so important to do everything smartly and quickly,—no waste of time, no failure to seize every opportunity. If you are attending a case in a private house, take a second nurse with you. With two nurses it is all so easy, with one it is all fumbling and loss of time. Thus to stitch a perineum while the only one nurse holds the chloroform cap, is a most difficult procedure. With two, it is so easy to seize the opportunity to put in the stitches before the patient has recovered from the anæsthesia, and before the placenta is expressed.

One point about maternity homes, and one that has constantly to be borne in mind, is the mental condition of the patients after the shock of the delivery. In nervous and highly-strung women it is most noticeable; they are apt to make the most extraordinary allegations against the nurses and staff of the home, and to give the place a bad name. In many ways the running of a maternity home is a very thankless job from a matron's point of view. It is a most difficult position, and she should be warned of the nature of her work. The bed-rock of the position is that the attitude of a female, human or animal, towards her offspring is that of protection. If you come between a female and her cubs you know you are in for it; if you come between a woman and her babe look out for storms. The routine of a maternity home should be to remove the infant as little as possible from the presence of the mother. It should be washed, bathed and dressed in her presence, and only removed to another room for very serious reasons, such as severe illness on the part of the mother, or want of sleep and very disturbed nights. The mother feels that she is neglected unless she has constant attendance night and day, hence the staff of a maternity home must be larger than that of a nursing one. In India I have often regretted that a hostel is not attached as a matter of routine to both classes of these institutions; to have the friends close at hand is a relief to everyone concerned, and if I were a matron I should at least let them keep watch from time to time.

Abscess of the breast.—The association of this abscess and unclean axillæ, which has been so frequent in my experience that I cannot help thinking they are connected, emphasises the necessity for keeping that part surgically clean, by the use of boric power, or swabbing with listerine or some antiseptic. It is a natural manœuvre for the nurse to begin sponging the axilla first, then continuing the movement over

the breast which cannot but smear the nipple with axillary sepsis.

Replacement of uterus.—It should be the routine practice to examine for any retroversion three weeks to a month after delivery, and, if this exists, to correct the fault by a pessary; much subsequent trouble is saved, as at that time the uterine wall is softer and more amenable to continued pressure and support.

The binder.—This can be lightly applied with safety-pins. It is a mistake to place a pad over the uterus, and a tightly drawn binder over this. This practice produces pelvic congestion, more lochial discharge, and subsequent subinvolution. I have seen serious post-partum hæmorrhage produced by its application, which stopped on its removal, and explained how the patient at a previous delivery had nearly lost her life.

CHOLERA PROPHYLACTIC VACCINATION: AN EXPERIMENT IN A VILLAGE DURING AN EPIDEMIC.

By ASHTOSH ROY, L.M.S.,

Hazaribagh.

(Reported with permission.)

INTRODUCTION.

IN a previous paper on the subject published in the *Gazette*, in June last, I dealt with some of the features of "Cholera Prophylactic Vaccination" with the "New Cholera Vaccine," of Kasauli, in connection with the local cooly recruiting agency. The present paper is the report of an experiment done in a localised, but detached area, named Hurhuru, a village situated within the Municipal town of Hazaribagh, during the recent cholera epidemic. I believe, but I am, of course, open to correction, that this is the first experiment of its kind done amongst the civil population in India, with the "New Cholera Vaccine." Two injections were given as recommended by the Kasauli authorities. The first of these was given during the height of the epidemic. The circumstances were all in favour of its spread (the vaccine was thus put to the severest tests), and it lasted for full six weeks before the injection was given. The ordinary sanitary measures, as far as practicable, were taken without any success. The result was most surprising. The first injection was marked by a sudden fall, both in the daily number of attacks and deaths. No cases occurred after the second injection. The epidemic was completely checked within a fortnight from the date of the first injection.

It is, therefore, very desirable that the experiment may be done on a large scale and, if found successful in other epidemics, it will not only be a distinct advance over the ordinary prophylactic measures which are not unoften frustrated in the absence of any co-operation on the part of the people, but will be a great boon amongst the masses, who are ignorant and unwilling to apply and follow ordinary sanitary laws, for cholera plays a great havoc amongst the civil population in India.

Below is given a full report of the recent cholera epidemic in village Hurhuru, with special reference to the effect of "Prophylactic Vaccination" with the "New Cholera Serum" of Kasauli:—

The first case of cholera officially reported from Hurhuru was on the 11th June, 1919, and the first death the next day, though I learn from the villagers that "sporadic" cases occurred before that date. Since then there were several attacks almost every day till the disease assumed the "epidemic" type. It lasted for about two months till it subsided by about the second week of August.

The only available official record of the entire population of Hurhuru was shown in the last census report (1911) as 782. But we can hardly rely on the figure of such an old date, specially after the great cholera "Epidemic" of 1917, and the "Influenza Pandemic" of last year, which carried away a large number of the population (roughly about 2 per cent. from cholera and 4.5 per cent. from influenza). I think the present population is about 650.

The total number of attacks during the recent epidemic which lasted from 11th June to 10th August, 1919, after which the attacks ceased, was 130 or 20 per cent. of the entire population. The total number of deaths during the above period was 78 or 12 per cent. of the entire population and 60 per cent. of the total cases of attacks.

For a month and a half, the sanitary officers of the Municipality tried their level best to check the epidemic by applying all the recognised sanitary measures, but, as happened elsewhere, there was want of co-operation on the part of the people which frustrated their object, as the following extracts from the Municipal record will show:—"The village people are still watching us with distrust and are not helping us."—Extract from the Report of Assistant Surgeon S. N. Banerjee, dated 26th June, 1919.

Interested and designing persons like the village quack and "Naya" or priest of ghost worship, not seldom excite the suspicion of the simple village folks by circulating vague rumours and giving dark hints regarding the sanitary measures taken by the authorities and thus prevent their co-operation.

The Sanitary Commissioner of our province came here on tour and inspected the village. The epidemic was then at its height and as all ordinary sanitary measures, in as far as they could be successfully applied, absolutely failed not only to check but even to modify the epidemic, it was suggested that the experiment of cholera "Prophylactic Vaccination," which had been found to be highly efficacious in the various cooly recruiting agencies of the "Tea District Labour Supply Association" of this province and elsewhere, might be tried.

A glance at the map of the Hazaribagh Municipality attached herewith (Map No. 1), will show that it is peculiarly constituted. Besides the Municipal town proper, where the houses

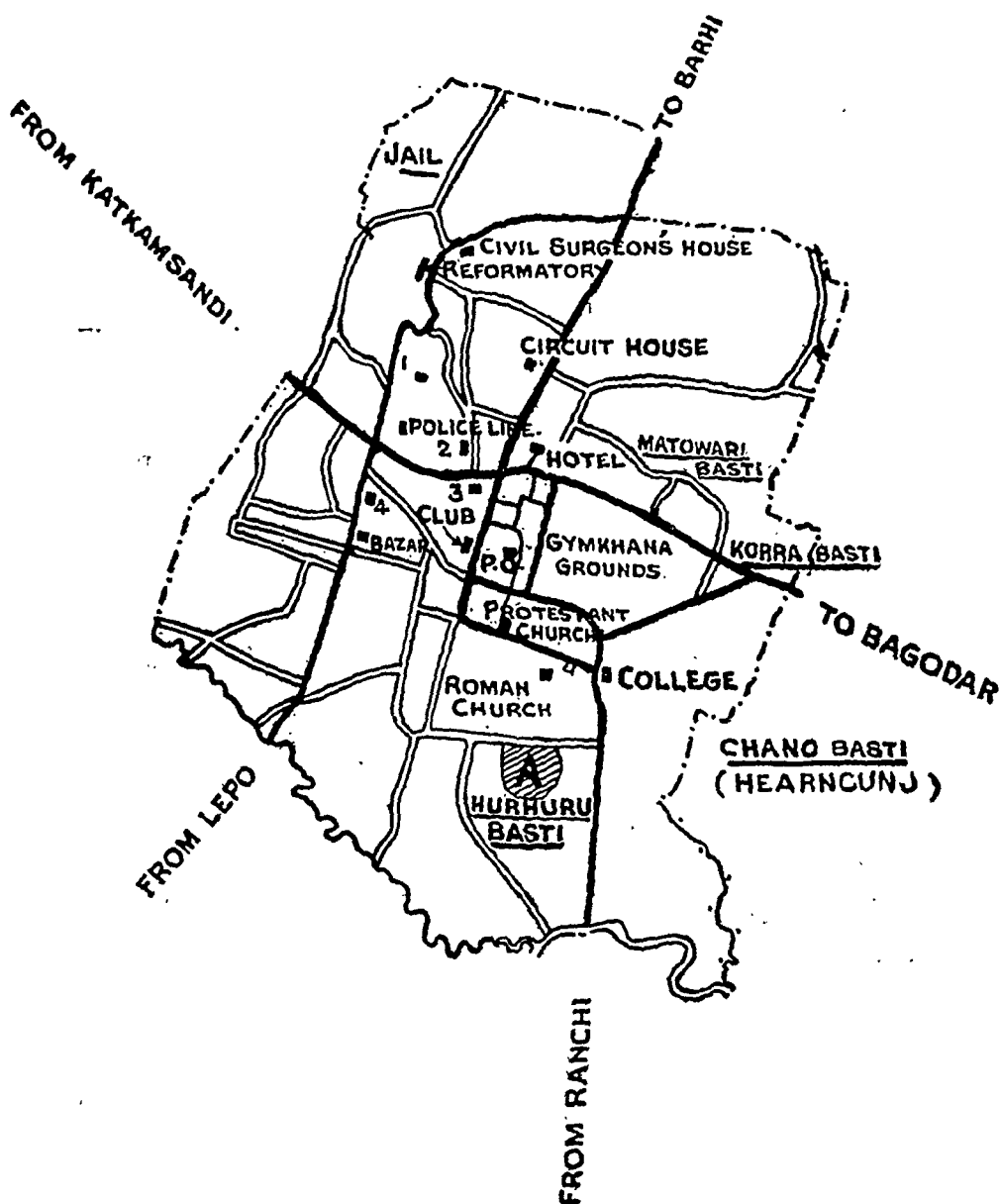
CHOLERA PROPHYLACTIC VACCINATION: AN EXPERIMENT IN A VILLAGE DURING AN EPIDEMIC.

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Hazaribagh.

PLAN OF HAZARIBAGH TOWN SHOWING THE POSITION OF HURHURU

SCALE 1 INCH = 1 MILE



Drawn by
P. Dutta.
15.8.19.

are close together, there are detached villages with extensive paddy fields intervening. One of these situated to the south-east corner is the village Hurhuru, marked "A" in Maps I and II, where the epidemic was raging. The detached position of the village "basti" (with its own water-supply, from wells), from the town proper (the intervening paddy fields being 400 to 500 yards from the nearest houses of the town, which latter are dotted in in Map No. II), prevented the spread of the epidemic to the "bazar." For the same reason and on account of its limited population of about 650 souls, it was admirably suited for the experiment. E. H. Berthoud, Esq., I.C.S., the Deputy Commissioner, seeing all these advantages, readily assented to the suggestion and very kindly permitted me to try the experiment of giving two injections with the "New Cholera Vaccine" of Kasauli to the entire population of the village.

In the meantime cholera was raging very furiously in the village and carrying away a large number of victims. The people were looking askance at the sanitary measures of the Municipal officers; their "Naya" or priest of ghost worship, as well as the village quacks failed them, and they did not know where to look for help and relief. At this juncture when I proposed to them to take injection, I found to my surprise that they readily agreed. I am more or less acquainted with most of the villagers, but in spite of my personal acquaintance, they would not have readily agreed to the proposal, if the circumstances had been different.

The Christian population of a neighbouring village (Hearngunj) was inoculated by Miss Jellett and Miss O'Meara, Lady Doctors attached to the local mission, who are universally respected. The villagers knew this fact and this, to a great extent, overcame their prejudice against injection and smoothed the difficulties I anticipated.

The "prophylactic" effect of the cholera vaccine was put to the severest test in this experiment for the following reasons :—

(1) Insanitary condition not only of individual houses, but of the entire village, which is common to most villages in this part of the country.

(2) Poverty of the villagers, who are almost all petty cultivators and day labourers.

(3) Poor health of the villagers owing to last year's "Influenza Pandemic" coupled with the high price of food-stuffs and clothing.

(4) Undue exposure to the moisture and dampness of the soil and the rigours of the atmosphere—this being the reaping season. The people were working in their fields the whole day, ankle-deep in mud, with rain pouring over their heads and bodies; at night they return weary and tired to their miserable homes and a meagre meal.

(5) And last, but not least, the epidemic was not only present amongst them for a month and a half, but was at its height when the first injection was given, on the 28th July. In fact

the day of maximum attack and death was the 27th.

In short, one cannot conceive of a more unfavourable combination of circumstances for the arrest of an epidemic of cholera.

A glance at the accompanying combined chart of attacks and deaths will clearly indicate the "Prophylactic" value of the vaccine. From 18 attacks and 13 deaths, the maximum daily number on the 27th of July, it came down to one attack and two deaths on the 30th, the first batch being injected on the 28th. As others were waiting to take the first injection, there was a second rise on the 31st, but the number of attacks and deaths were limited to 14 and 7 respectively. Both the attacks and deaths then began to decline, and the first injection was completed on the 1st of August. The second injection was begun on the 8th and completed by the 11th. By that time fresh attacks had stopped altogether (the last attack was on the 10th). Two old cases died, one on the 13th, and the other on the 14th. There are at present no cases, new or old, in the epidemic area. In other words, the epidemic had stopped altogether. It may be noted that no cases occurred after the second injection.

DETAILED REPORT OF THE INJECTIONS.

The first injection was begun on the 28th of July, and was finished by the 1st of August. The number of persons "vaccinated" was as follows :—

28-7-19	.. 1st batch	.. 227 persons.
30-7-19	.. 2nd batch	.. 280 persons.
1-8-19	.. 3rd batch	.. 28 persons.

Total .. 535 persons.

About 50 people succumbed to the disease before the first injection was given. Some had already got the disease, and were suffering from it and could not, therefore, be inoculated. Infants on their mother's breast (under 1 year) were excluded. A few people went out to work outside as day labourers and were not "vaccinated." A fewer number refused to be injected.

The second injection was begun on the 8th of August and was completed by the 11th. The number "vaccinated" was as follows :—

8-8-19	.. 1st batch	.. 169 persons.
9-8-19	.. 2nd batch	.. 50 persons.
10-8-19	.. 3rd batch	.. 226 persons.
11-8-19	.. 4th batch	.. 24 persons.

Total .. 469 persons.

A good number of people had the disease and were, therefore, excluded from the second injection.

A number of persons declined to take the second injection on the ground that as the epidemic had ceased, it was superfluous to take the second injection.

Thirty-six persons, who were amongst the sceptical as to the value of the injection when

first given, seeing its beneficial effect, came of their own accord when the second injection was being given and received an injection for the first time. *This shows how the villagers had been impressed by the good results which followed the first injection.*

After the first injection there were 27 attacks amongst those who were inoculated. No attack followed the second injection.

For statistics of attacks, deaths and recoveries amongst the "inoculated" see the tabular statement attached herewith.

There were altogether 27 attacks amongst the inoculated who number 536 persons. We can safely exclude 1, 2, 3, 5, 6, 7, 8, 10 and 14 of the series who had attacks within a few hours of injection and who must have had a pretty stiff dose of "Cholera vibrio" already infecting their system before the injection of

died one on the 4th day and the other on the 5th day of attack.

Out of 16 attacks, therefore, as detailed below, there were 6 deaths or 37.5 per cent. and 10 recoveries or 62.5 per cent.

Attack within a few hours of inoculation.	9 cases Nos. 1, 2, 3, 5, 6, 7, 8, 10 and 14 ... 3 recoveries.
Attack on 3rd day of inoculation.	1 case No. 17 ... Nil.
Attack on 4th day of inoculation.	5 cases Nos. 4, 9, 11, 12 & 13 2 recoveries.
Attack on 5th day of inoculation.	2 cases Nos. 15 and 16 ... 1 recovery.
Attack on 7th day of inoculation.	3 cases Nos. 18, 19 and 20 ... 2 recoveries.
Attack on 8th day of inoculation.	3 cases Nos. 21, 22 and 23 ... All recoveries.
Attack on 10th day of inoculation.	2 cases Nos. 24 and 25 ... All recoveries.
Attack on 12th day of inoculation.	2 cases Nos. 26 and 27 ... Nil.

Tabular statement of attacks after 1st injection with results.

Serial No.	Date of vaccination.	Date of attack.	Result : date of death.	Age.	Sex.	Name.	Caste.	REMARKS.
1	28-7-19	23-7-19	D. 29-7-19	8	Male	Dharam ...	Dusadh ...	Attack during the night of injection and death next morning.
2	28-7-19	28-7-19	D. 28-7-19	8	Female	Budhni ..	Do. ...	Do. and death.
3	28-7-19	28-7-19	R.	4	Male	Jamna ...	Do. ...	Do. within 2 hours of injection but recovered.
4	28-7-19	31-7-19	D. 31-7-19	Adult	Do.	Nanka ...	Teli ...	
5	30-7-19	31-7-19	D. 31-7-19	7	Female	Rahimini ...	Mohammedan ...	Attack during the night of injection and death next morning.
6	30-7-19	31-7-19	R.	6	Do.	Barni ...	Do. ...	Do. recovery.
7	30-7-19	31-7-19	D. 31-7-19	12	Do.	Jamni ...	Telin ...	Do. death next day.
8	30-7-19	31-7-19	D. 31-7-19	Adult	Male	Budhon ..	Mohammedan ...	Do.
9	23-7-19	31-7-19	R.	7	Female	Tetri ..	Do. ...	
10	30-7-19	31-7-19	R.	12	Do.	Ghomni ..	Telin ...	Do. during night of injection but recovery.
11	28-7-19	31-7-19	R.	Adult	Male	Bandhan ...	Majam ...	.....
12	28-7-19	31-7-19	D. 1-8-19	5	Female	Petri ...	Dusadhin ...	.....
13	28-7-19	1-8-19	D. 1-8-19	Adult	Do.	Punti ...	Telin ...	.....
14	30-7-19	1-8-19	D. 1-8-19	Do.	Do.	Jagni ...	Dusadhin ...	.....
15	30-7-19	3-8-19	D. 3-8-19	Do.	Do.	Chamni ..	Do. ...	Attack within the night of injection.
16	30-7-19	3-8-19	R.	Adult	Do.	Ramna ...	Do. ...	Typical attack, fair pulse (Dr. Jellet's Note); Nos. 16-26.
17	1-8-19	3-8-19	D. 4-8-19	Do.	Do.	T'atri ...	Do. ...	Do. severe.
18	30-7-19	5-8-19	R.	12	Male	Bandhan ...	Goala ...	Do. pulse palpable.
19	30-7-19	5-8-19	R.	Adult	Do.	Barhan ..	Do. ...	Do.
20	30-7-19	5-8-19	D. 6-8-19	Do.	Do.	Doobur ..	Dusadh ...	Do. severe, pulseless.
21	30-7-19	6-8-19	R.	Do.	Do.	Gothu ...	Teli ...	Very slight.
22	30-7-19	6-8-19	R.	Do.	Do.	Barhan ...	Do. ...	Do.
23	30-7-19	6-8-19	R.	Do.	Do.	Shiba ...	Do. ...	Typical.
24	10-7-19	8-8-19	R.	Do.	Female	Bandhni ...	Dusadhin ...	Slight.
25	30-7-19	8-8-19	R.	13	Do.	Rudni ...	Brahmin ...	Do.
26	30-7-19	10-8-19	D. 13-8-19	Adult	Do.	Sunia ...	Dusadhin ...	Very feeble constitution, survived collapse state, urine was secreted but died.
27	30-7-19	10-8-19	D. 14-8-19	Do.	Male	Bajwa ..	.....	Very anæmic, had high fever when inoculated.

the prophylactic vaccine. The attacks then became 18 only, i.e., 3.3 per cent. of the persons inoculated.

We may exclude amongst the dead Nos. 26 and 27, who according to Kasauli directions were not only unfit for inoculation on account of their very poor state of health, but who did not care to take the second injection on the 11th day, as laid down by the Kasauli authorities. They had the attack on the 12th day of first injection and

The following table gives the percentage of attacks, deaths and recoveries :—

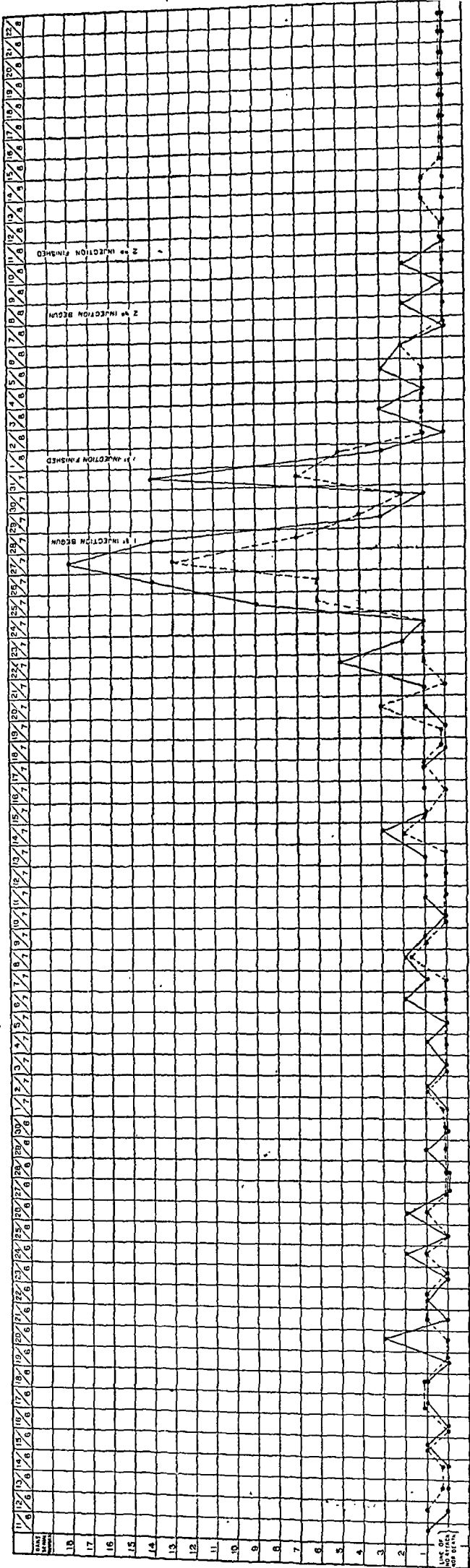
	Attacks Per cent.	Recoveries. Per cent.	Deaths. Per cent.
Total population ...	20	40	60
Non-inoculated ...	16.5	36	64
Inoculated ...	3.5	63.5	37.5

The prophylactic value of the vaccine has been well brought out here as well as in the

CHOLERA PROPHYLACTIC VACCINATION : AN EXPERIMENT IN A VILLAGE DURING AN EPIDEMIC.

BY SHYAM SUKUMAR ROY, L.M.S.,

Hazaribagh.



combined chart of attacks and deaths attached herewith.

Miss Jellet, who very kindly treated the cases of attacks after inoculation with Rogers' method of treatment by "Enteric-coated permanganate pills," gave me notes of cases 16 to 26, of the series, and also told me that, following close on the injections, the attacks were very violent and the death rate very high, after a few days the attacks, though typical so far as vomit and stool are concerned, were less severe, the pulse perceptible and was not completely lost and recovery was the rule.

I may also note here that beginning from the top of the series, the attacks were confined mainly to children and women, the individual attacks severe and death rate very high. Further down the attacks were confined mostly to male adults, were less severe and mortality lower.

The fact that ordinary sanitary measures without the co-operation of the people are well-nigh useless forcibly points to the conclusion that prophylactic vaccination is clearly indicated.

The following points which are of medical interest may be noted :—

- (1) Fever of small duration was more evident after the second than the first injection.
- (2) Fever generally occurs in a case who suffered recently from it, after injection.
- (3) Fever is aggravated in a patient already suffering from it, after injection.
- (4) Fever results when a superficial vein is accidentally punctured during an injection.
- (5) Very weak, debilitated and anæmic individuals would do well to avoid the injection, as well as those suffering from gastro-intestinal trouble.
- (6) A pretty good number of children were inoculated without apparently any bad result. In fact No. 3 in the series was a boy of 4 who had the attacks two hours after injection, but recovered. The number of children inoculated were :—

1st injection	..	..	71
2nd injection	..	..	59
Total			130

THE ECONOMIC VALUE OF ANTI-CHOLERA INOCULATION.

By T. C. McCOMBIE YOUNG, M.D., D.P.H.,

MAJOR, I.M.S.,

Sanitary Commissioner, Assam.

It has fallen to me as Sanitary Commissioner and *ex-officio* Superintendent of Emigration, Assam, to compile some observations bearing on the value of inoculation with anti-cholera vaccine as a prophylactic against the prevalence of cholera among labour emigrants *en route* to Assam. I am aware of the many pitfalls which beset one's path in attempting to interpret statistics, but as the compilation seems to offer definite evidence in favour of the efficiency of the

measure and as the conclusion to be drawn is not unimportant, the facts and figures are put forward, as they may perchance carry conviction to others as well as to oneself.

One should perhaps commence by explaining that the emigration season of 1919 has been, in many ways, an exceptional one. Recruiting for the tea industry reached a very low ebb during the latter years of the war, and the influenza epidemic of the autumn of 1918 had greatly depleted the available labour force of the tea industry. In the recruiting districts of Bihar and Orissa, the Central Provinces and the United Provinces, the partial failure of the grain crops and the resulting scarcity led to very large numbers of labour recruits coming forward for enlistment and these two factors, namely, a big demand and an ample supply, led to the emigration, between December, 1918, and June, 1919, inclusive of 239,885* labourers, most of whom were famine stricken, debilitated people, whose condition pre-disposed them to attacks of epidemic diseases.

In the commencement of the emigration season in December and January, influenza was prevalent among the emigrants, taking a considerable toll of life, and in February, an increasing incidence of cholera, which was brought prominently to notice by some disastrous voyages of infected river steamers, added to our troubles, and strained the resources of our emigration hospitals and staff to the utmost. The voyages of the river steamer *Pegu*, which left Goalundo with 666 souls on board, and eventually left Tezpur, when freed from quarantine, having had in all 143 cases of cholera, may be cited as an example of the conditions then prevailing, which gave rise to grave apprehensions as to future developments. Under these circumstances, the permission of the Local Administration was obtained for a visit to Calcutta to consult with Lt.-Col. Kennedy, the Chairman, Assam Labour Board, and with Messrs. Begg, Dunlop (Secretaries to the Tea District Labour Supply Association), as to how the difficulties of the situation might be alleviated. In discussion with Lt.-Col. Kennedy and Mr. Pickford, I ventured to urge the advisability of inoculating all labour recruits with anti-cholera vaccine before their departure from the recruiting districts, but in considering the practical details of such arrangements, we were faced with the difficulty that if the accepted ritual of a double dose of anti-cholera vaccine, separated by an interval of ten days, were to be followed, it would mean the provision of accommodation in the district recruiting agencies on a scale which would, to all intents and purposes, negative the proposal as a practical proposition. In this dilemma, Sir Leonard Rogers' advice was sought as to the value for our purpose of a single inoculation with the idea of conferring some degree of temporary immunity, to tide the inoculated

* Figures supplied by Chairman, Assam Labour Board.

emigrants over a period of risk while *en route* to the tea districts. Sir Leonard Rogers lent the weight of his support to this proposal, and Mr. Pickford, on behalf of the Tea Districts Labour Supply Association, thereupon set to work to organise the work of inoculating all labour recruits for Assam before their despatch from the recruiting agencies. Many difficulties were encountered, but they were successfully overcome. For example, objections were urged on the ground of risk during the "negative phase"; but again Sir Leonard Rogers came to our rescue, and advised that in practice the "negative phase" might be neglected, if those who showed signs of undue reaction to the vaccine were held back for a few days before being despatched. This advice was adopted and accordingly by March 16th, inoculation with anti-cholera vaccine obtained from the Central Research Institute, Kasauli, was in force in all the recruiting centres. By the third week in March, inoculated coolies began to appear upon the railway routes and by the fourth week of March most of the emigrants travelling to Assam, whether by rail or by river, had been inoculated with a single dose of cholera vaccine before commencing their journey. In regard to the strength of dose given, I understand from the Secretaries of the Tea District Labour Supply Association that, when the inoculation of coolies was first started by their Association, it was arranged that a rather larger dose should be given than that laid down as a first dose, when the complete inoculation of two doses is given. On the other hand, a writer in the *Indian Medical Gazette*, of June, 1919, in describing the technique followed in Hazaribagh, states that $\frac{1}{2}$ c.c. was the maximum dose given. The actual standard of dosage adopted is, therefore, not clear, and may perhaps have varied in different agencies.

Those who have been concerned with the work of inoculation are curious to ascertain the result of their labours, and those who have met the cost of it wish to know what they have received for their money, and, as the individual with whom the suggestion originated, the writer, is also interested in ascertaining the results. The method adopted has been to ascertain the cholera mortality on the transit routes in Assam for a period of five months, *i.e.*, from January to May, and to compare the cholera mortality in the period before inoculation, and after it. This period divides itself into two, *i.e.*, that before the 15th of March, in which there was no inoculation, and that after it, when all were inoculated. The number of labourers travelling before and after inoculation being known, and the cholera prevalence in the areas from which they were recruited showing no reduction, then one might fairly attribute any appreciable reduction in cholera mortality to the influence of inoculation, if no other important factors were simultaneously operative in the reduction of cholera mortality.

Before any definite conclusion can be drawn from the statistics, therefore, one has first to

consider whether any other potent factors were at work to diminish cholera prevalence, during the second period, which were not operative in the first. During the second half of this period the emigration hospital at Goalundo, the condition of which had been unsatisfactory, was greatly improved, and the condition of the Forwarding Agents' Depôts throughout the route was somewhat amended as the result of the visits of the Inspecting Officers.

Although those of us who worked to effect these improvements would be reluctant to concede that our efforts were entirely infructuous, yet we would, I think, be agreed that the reforms that were effected were not so drastic as to have had any marked effect *per se* in view of the continued prevalence of cholera in the areas from which the emigrants were being recruited, and the continued risk of infection in the halting places *en route*, from water-supplies open to contamination and from imperfect conservancy arrangements.

In so far as one can discover, no new factors, other than the introduction of inoculation, were effectively operative in the reduction of cholera mortality in the period after March 15th, and if this view be accepted as credible, then we may turn to an examination of the statistics to see what was the result of the inoculations. Table No. I shows the attacks and deaths on the transit routes from cholera week by week, from January to May. The figures have been compiled from the returns of the Government and Railway Emigration Hospitals and Depôts, and from the statistics supplied by the Railway and Steamer Companies, and they are substantially correct. Through the courtesy of Lt.-Col. Kennedy, and his staff, the figures showing the number of coolies despatched to Assam, week by week, during the same period, have been obtained, and are shown in a parallel column in the same table.

Table II shows the weekly cholera mortality in the recruiting districts, which has been compiled from figures obtained through the courtesy of the Sanitary Commissioners of the Provinces concerned.

Column 6 of table I shows, week by week, the ratio of cholera deaths per thousand of emigrants despatched during the week in question; it displays the beginning of the cholera outbreak on the *Pegu*. It shows that the mortality ratio was maintained at a high level throughout February, and until the end of the third week in March.

In the last week in March, we see that the ratio fell from 8.5 per mille, as it was in the previous week, to 3.19, and that thereafter the ratio decreased regularly and progressively, the mortality per mille in the last week in May being .54. Now these results appear to coincide with what one would expect to happen were anti-cholera inoculation to be the cause of decrease. With inoculation in vogue from March 15th, it follows that in the third week of March its effect, if any, would be obscured

by deaths among uninoculated travellers admitted in the previous week, and among uninoculated emigrants still proceeding by steamer, who, unlike railway emigrants, who travel faster, had started their journey before the commencement of inoculation. One would expect, therefore, that the effect would not be fully felt until the last week of March or the beginning of April.

The figures seem to show that this is what actually occurred, the fall in the mortality appears to be more than a mere coincidence, and it seems reasonable to suggest that the inoculation and the decreased mortality stand to each other in the relation of cause and effect. A critic might argue that the cause of this decrease of mortality should be sought in a decrease in the prevalence of cholera in the areas from which the emigrants were coming, which would be sufficient to account for the change. To meet this argument, I have compiled table II, which shows the actual cholera mortality week by week, in the provinces from which the bulk of the recruits were obtained. The bigger half of them come from Behar and Orissa and its feudatory states, but one scrutinises in vain the figures for that province to detect any tendency to a decline in the cholera mortality, about the middle or end of March. On the contrary the statistics supplied from the recruiting provinces (the detailed figures of which, for the sake of brevity, I am omitting), show week by week in every district a progressive increase in cholera mortality following the usual seasonal mortality with the advance of the season. One would expect that the cholera mortality upon the transit routes should follow the same course as in the recruiting districts were no potent factor operative to prevent it, but the actual facts are otherwise, which would seem to show the influence of some such preventive factor.

In short, a marked decrease in cholera mortality occurred on the transit routes after the introduction of inoculation, and at the time one would expect it to occur if inoculation were the cause. Table II furnishes evidence of the continuance and increase of cholera in the recruiting districts following the usual seasonal mortality, and it seems reasonable, therefore, to suggest that this marked decrease in the second half of the period under review was largely due to the effect of anti-cholera inoculation, commenced in the middle of it.

It is interesting and perhaps not irrelevant as confirmatory evidence to compare the figures for 1919 with those for the year 1908, when food scarcity also prevailed in the recruiting areas, recruiting was brisk, and cholera was rampant. From the Eastern Bengal and Assam Government Resolution on Emigration for that year, one learns that 84,824 emigrants travelled to Assam, and that 627 deaths occurred on the transit routes from cholera, or 7.4 per mille. If we compare these with the figures for 1919, we find that from 1st January to 21st March, 106,934 coolies were carried, all except a few

in the last week being uninoculated, and that 726 deaths from cholera occurred on the transit routes, or 6.78 per mille. After the introduction of inoculation, between March 22nd to May 31st, 89,609 coolies left the recruiting agencies for Assam, of whom 166 died of cholera on the transit routes, or 1.85 per mille. It would, therefore, appear probable that the mortality among uninoculated coolies travelling to Assam would be about 7 per mille, and that among those inoculated with a single dose of cholera vaccine, it is less than 2 per mille.

TABLE I.
Mortality from Cholera en route.

1919.	Assam Bengal Rail- way.	Eastern Bengal Railway.	Steamer Route.	Total.	Weekly number of Emigrants des- patched.	Ratio of deaths per mille of Emigrants travelling.
	Deaths	Deaths	Deaths	Deaths		
January						
1-7th	6	...	6	12	18,300	.65
8-14th	...	...	11	11	6,065	1.81
15-21st	...	...	109	109	4,925	22.13
22-31st	...	...	21	21	9,590	2.18
February						
1-7th	...	10	32	42	7,413	5.66
8-14th	5	9	71	85	8,480	10.02
15-21st	9	5	61	75	8,255	9.08
22-28th	5	6	41	52	9,630	5.39
March						
1-7th	20	20	86	126	11,071	11.38
8-14th	12	21	76	109	13,333	8.17
15-21st	6	19	59	84	9,872	8.50
				726	106,934	6.78
22-31st	7	12	33	52	16,289	3.19
April						
1-7th	5	15	14	34	12,261	2.77
8-14th	2	10	12	24	9,124	2.63
15-21st	...	1	8	9	7,515	1.19
22-30th	...	3	10	13	11,669	1.17
May						
1-7th	2	6	5	13	8,277	1.57
8-14th	3	2	4	9	8,499	1.05
15-21st	2	2	3	7	7,441	.94
22-31st	1	...	4	5	9,134	.54
	85	141	666	166	89,609	1.8

The change in the incidence of cholera mortality among emigrants, which followed the introduction of inoculation, was of the greatest importance to those who were concerned with the emigration arrangements on the transit routes in Assam this year. Had the mortality on the transit routes remained at its March level or increased to something greater, as might well have happened in the absence of inoculation, the situation on the transit routes would have become well-nigh unmanageable, heavy loss of life would have occurred, and, in view of the grave risk of dissemination of cholera throughout Assam which the continuance of these conditions would have entailed, unrestricted emigration could hardly have been continued owing to the risks,

losses and scandals which would have occurred.

If the conclusions deduced from these facts and figures be correct, it does not appear to be unduly straining probabilities to suggest that anti-cholera inoculation in the hands of an efficient organisation rendered possible the recruitment of nearly a quarter million labourers for the Tea Industry in Assam, during the present

TABLE II.

Mortality from Cholera in Recruiting Areas.

1919.	Madras.	Bengal.	United Provinces.	Behar and Orissa.	Central Provinces.	
January.						
Week ending 4th	555	531	85	232	40	Total of Cholera deaths in recruiting areas in period anterior to inoculation.
" " 11th	597	549	10	228	1	
" " 18th	585	797	9	293	17	
" " 25th	879	1,156	...	434	46	
February.						
Week ending 1st	407	1,662	...	386	41	
" " 8th	400	975	...	477	39	
" " 15th	412	1,265	...	600	63	
" " 22nd	387	1,028	16	479	90	
March.						
Week ending 1st	263	764	...	483	59	
" " 8th	243	1,057	...	640	56	
" " 15th	274	2,706	...	736	116	
" " 22nd	235	3,472	6	815	129	
Total ...	5,237	15,962	126	5,803	697	27,825
Week ending 29th April.	183	3,401	7	1,044	123	Total of Cholera deaths in recruiting areas in period after introduction of inoculation.
Week ending 5th	133	2,396	43	1,227	164	
" " 12th	235	2,016	77	1,661	216	
" " 19th	289	994	499	2,296	638	
" " 26th	343	1,869	2,068	2,857	817	
May.						
Week ending 3rd	367	1,148	3,321	2,980	1,213	
" " 10th	467	1,075	2,748	2,915	1,098	
" " 17th	371	955	2,134	2,795	1,702	
" " 24th	299	758	2,318	2,665	2,068	
" " 31st	304	...	2,517	2,165	2,031	
Total ...	2,991	14,612	15,732	22,565	10,070	65,970

recruiting season. If this be conceded, it follows without further argument that the benefit conferred on the province in general and on the Tea Industry in particular by inoculation has been great and that the economic value of anti-cholera inoculation has been, in this connection, very considerable.

DIABETES IN MADRAS.

By S. KRISHNAMURTI AIYER, M.B.,

Sanitary Commissioner, Travancore.

THE contributions made by Lt.-Col. McCay, I.M.S., in the three reports, published in the *Journal of Indian Medical Research*, and by Lt.-Col. Waters, I.M.S., by his book on diabetes, have much advanced the knowledge on the subject of diabetes, and the people of India are grateful to them for their services. It is admitted even by them that the end has not been reached and that further researches on the

subject are required. The habits of the people, the staple article of food they take, the climate of the places, etc., are so varied in India, that for any accurate knowledge to be obtained, the investigation should not be confined to any one place or people, but should be extended to several places and people. For instance, the lines of treatment advised by Lt.-Col. Waters for adoption among the Bengali Brahmins, are inapplicable in the case of Madras Brahmins, for the reason that while fish forms an article of diet in the former, it is a prohibited article in the case of the latter. And even among the Madras Brahmins the habits of the Andra Brahmins differ from those of Tamil Brahmins, and so on.

Now that the public health movement looms largely in the minds of the people and Government, and that, as far as the Madras Presidency is concerned, a Public Health Association has been started under the patronage of H. E. Lord Willingdon, the Governor of Madras, and which has the good fortune to secure as its President H. E. Lady Willingdon, and with subscriptions flowing from maharajas, rajas, zemindars, etc., it is hoped that an investigation will be made into the disease which carries away every year thousands of men of light and learning, in the midst of their labours. The widespread prevalence of the disease among the intelligent and educated classes demands early and careful investigation into its cause, treatment, etc., not only from the public health point of view but also the economical and sociological.

Heredity is referred to in almost all works on the subject as a cause of the disease. The term has been used rather loosely, and there has been so much controversy about the correct connotation of the term, from the time of Charles Darwin, that it is necessary before any progress can be made in the study of the subject, to settle the point once for all. The highly developed biceps and deltoid muscles of the blacksmith are not inherited, in the correct meaning of the term, by his children. Heredity implies something germinal brought by the germ-plasm, while the highly developed muscles are only acquired by constant use, and it is, therefore, nurtural. The germinal and nurtural principles are often confounded one with the other. It is imperative, therefore, to find out in the case in question, whether the disease is communicated germinally or acquired nurturally. In other words whether there is something in the germplasm of the parent which goes to form their offspring that gives the disease or whether it is on account of the environment, and the habit of the offspring, that the disease is acquired. This is the most important point and on its correct settlement depends the success or otherwise of the steps to be taken for the eradication of the disease.

According to the latest advances made in the science of genetics, it has been found that the germplasm of each individual consists of several

thousands of "Mendelian factors" or "physiological units" of Spencer, and in his children some of the factors remain dominant and others recessive. For example, it is known that colour blindness is not found among women. Supposing that the father of a girl is suffering from colour blindness, it will not appear in his daughter, but it will in her son. The explanation given is that the colour blindness factor is incompatible with some factor found in the female organism, and so it is repressed in her, but in the male as there is no such antagonistic factor, it becomes dominant.

It is a known fact, as far as the Brahmins of the Madras Presidency are concerned, that the disease was rare among them a few generations ago and that it is even now rare among the women, and more so among the widows. These are facts which require correct explanation for the proper treatment of the subject. As an explanation, it is said that the nervous strain is one of the chief causes—predisposing or otherwise—of the disease, and that it is not found to such an extent in women as in men. Whatever may be the case in other countries or parts of India, it can be said, without fear of contradiction, that as far as the Brahmin women of Southern India are concerned, particularly widows, who have to manage large families, educate their sons, marry their daughters, attend at the sick-bed of their children, the nervous strain to which they are subjected is more than that of men. And the cause, nervous strain, may, therefore, be given a very minor part in the causation of the disease, if not set aside altogether. There is very little difference between the meals partaken by men and women, and if there be any difference at all, it is that women take more sweet things than men.

But there are more important differences in the habits of men and women, and it is to them that we should turn for causes of the disease. The Brahmins, as a class, have their chief meal in the day, while among the non-Brahmin working classes, the chief meal is in the night. Rest is required for proper digestion after heavy meals. In the tropics not only the animal kingdom but the vegetable kingdom also, as will be evident from the drooping of stems and leaves in the mid-day sun, take rest, and this rest is more necessary in the case of Brahmins, for, in addition to the heat, their chief meals are taken during the day. In olden days where the business hours were restricted to the mornings and afternoons, the Brahmins had the necessary rest in the day; but in these days when offices and schools open at 10 A.M., and the usual heavy meals are taken before 10 A.M., there is actually no rest after meals. In the case of women they take plenty of rest after meals as they can afford to do so.

The second point of difference consists in the taking of the meal itself. As the Brahmin meal consists mostly of starch and as for the proper digestion of starch saliva is required, to stimulate the flow of the required quantity of saliva, the meals should be thoroughly masticated in the

mouth. In the case of office- and school- going men on account of hurry to be to time at their offices and schools, which may be distant from their houses, meals are simply bolted down in a few minutes. It is within the knowledge of every Brahmin that no more than 10 or 15 minutes are taken for the meals. Bolting has got double disadvantages. It interferes with the proper breaking up of the food materials; for the digestive juice to act sufficient time is not allowed for the required quantity of saliva to flow. When meals get into the stomach, on account of the deficiency of the alkaline saliva, which is required to stimulate in the stomach the flow of acid gastric juice, the digestion in the stomach is also interfered with, and so there is interference with digestion throughout the intestinal tract. On the other hand the women folk spend a long time in taking their meals and they have time for mastication and digestion.

It is known that widows take only one meal a day and they fast at least once or twice a fortnight. Now that fasting has been recognised as one of the forms of treatment, the good effects of the periodical fasting observed by Brahmin widows on the prevalence of the disease among them, is clear, but men generally take more than one meal even in their advanced years and that is the third point of difference.

The fourth and last point of difference consists in the kind of meal taken. The widows after the ordinary heavy meal in the day take what are called "dossaies" in the night. The dossai is made of rice flour with an addition of black gram flour. It is impossible to bolt down dossai and any attempt to do so will be met with danger to life by suffocation. The nature of this kind of meal requires thorough mastication. The men, however, in olden days, are said to have taken dossai during the night, but now it is not the case. They take ordinary rice in the night also.

Lt.-Col. Waters in his treatise on diabetes says that deputy magistrates who move about in their districts are less prone to the disease than the sedentary sub-judges and munsiffs who sit in courts all day, and draws the inference that want of exercise in the case of latter is one of the causes of the disease. No doubt want of exercise is a cause, but the relative absence of the disease in the case of deputy magistrates admits of another interpretation as well. In the case of deputy magistrates they move about mornings and evenings, but in the day-time they take rest after meals, but in the case of sub-judges and munsiffs they have no rest after meals as the business in courts are conducted between 11 A.M. and 5 P.M. So the relative absence of the disease among the deputy magistrates may be attributed to the rest they take after meals in the day. Further, as far as the Madras Presidency is concerned, the sub-judges and munsiffs systematically play tennis, which is not the case with deputy magistrates.

The consideration of the facts described above requires for any proper investigation on the

subject to be made in the Madras Presidency, four committees at least, one for the Andra community, in whose diet large quantity of chillies and ghee go, one for the Canarese, who take ragi in addition to rice, the third for the Tamils, in the diet of whom dhal is a chief ingredient, and the fourth for the Malayalies, who in addition to rice take tapioca and coconut to a large extent.

Some time ago a philanthropic private gentleman in Madras placed a large sum of money for investigation into the disease, but the great war which has now ended, broke out then and the investigation was not undertaken. Now the Public Health Association, which has been started under very auspicious circumstances, will, it is hoped, commence its work by making investigations into this disease, which takes away yearly many valued and valuable lives.

A CASE OF OPHITOXÆMIA—SNAKE POISONING: SNAKE IDENTIFIED, ECHIS CARINATA, BY THE NATURAL HISTORY SOCIETY, BOMBAY.—RECOVERY.

By D. J. ASANA, L.M. & S.,

Civil Surgeon, Kaira.

ON the 1st of September, an American Mission lady brought down from a village, from about three miles off from Kaira, an old woman about 50, in a gharry. The old woman was bitten by a snake in the morning, at about 6 A.M., and she was brought to the hospital at 1 P.M.

Condition on admission.—The woman seemed much frightened. The fang marks were on the dorsum of the right foot, where pot. permanganate had been rubbed two hours after the bite. No ligature had been applied. There was slight oozing at the spot, the foot was painfully swollen, and she complained of severe pain at the middle of the abdomen and was spitting a good deal of blood about every five minutes. It was owing to this spitting of blood, she was induced to go to the hospital. On looking inside the mouth, immediately after cleaning and clearing the mouth, no ulcer or injury was seen. The mucous membrane of the hard palate was simply oozing, just in the same way as perspiration pouring out from the pores of the skin. She was immediately put to bed and was advised to remain perfectly calm as far as practicable. The bitten part was cleaned, antiseptic dressings were applied, and calcium chloride, 10-gr. dose, was prescribed every three hours, and one-third gr. emetine hydrochloride was given hypodermically, and alum gargles for the mouth as often as possible.

Condition in the evening.—No change. Pain in the abdomen and blood from the mouth continued.

2. *Notes next morning, 2nd September.*—She slept badly during the night, no motions, passed urine twice containing no blood, no change,

spitting of the blood just the same, but pain in the abdomen subsided. On removing the dressings it was observed that they were soaked with much blood, oozing from the wound. The patient complained of much pain and tenderness on the thigh of the bitten side, and the shoulder of the opposite side, on which there was a huge bluish patch indicating subcutaneous hæmorrhage.

Dressings changed and a mixture containing—calcium chloride gr. 10, ext. ergot liq. m. 10, adrenaline chloride sol. m. 5, aqua ad. 1 oz., m. ft., mixt. every three hours. Emetine hydrochloride gr. $\frac{1}{2}$, given hypodermically morning and evening.

3. *Notes next morning, 3rd September.*—Patient slept fairly well. No stools—urine passed three times without any blood, bluish patches observed yesterday were more full, tender and painful, and but there was appreciable change in spitting of blood for the better. Pulse somewhat weak.

All these days a large quantity of good milk was enforced as the diet.

Mixture continued, omitting calcium chloride and adding tr. digitalis, m. v. per dose, as pulse was getting weak. Ordered an ounce of castor oil at night.

Hypodermic injection of emetine hydrochloride, gr. $\frac{1}{2}$, morning and evening continued.

4. *Notes next morning, 4th September.*—Patient slept well, passed a good big stool without any blood, passed urine without blood, oozing from the bite wound completely stopped. Spitting of blood nearly stopped, saliva was slightly tinged with blood. Subcutaneous ecchymoses just the same, but less painful, wanted more food, puddings allowed in addition to the milk.

5. *Notes next morning, 5th September.*—Patient much better. No pain in the bitten part, fang marks seem healing. Spitting of blood absolutely stopped. Subcutaneous ecchymoses getting less painful, bluish colour slightly changing to reddish brown. Wants more food. Put on ordinary diet. Mixture continued. Hypodermic injection of emetine hydrochloride stopped.

6. *Notes next morning, 6th September.*—Patient much better. Spitting of blood stopped. Subcutaneous ecchymoses subsiding. She wants to go home. Pulse much improved.

7th September.—Patient rapidly improving; nothing except big reddish brown patches of ecchymosis, which are softening and absorbing.

8th to 10th September.—Patient quite well and discharged cured.

Reference made to the Bombay Natural History Society, and reply received confirming the poisonous species of the snake.

For ready reference, for refreshing the memory, I recapitulate the chief identification marks of *Echis carinata*:

1. Tail round.
2. Shields beneath the tail similar to those beneath the belly.
3. Snout and crown covered with small scabs similar to those on the back of the body.

4. Only a part of the last row of the costals is visible on either side of ventrals when the specimen is laid on its back.

5. Supraocular not divided.

6. Nasal touches the nostril and the first supra labial.

7. Diameter of the eye exceeds its distance to the nostril, and is greater than its distance to the edge of the lip.

8. Two rows of scabs between the eye and the supra labial.

9. Of the supra labials the 4th is the biggest.

10. Sub-linguals touch 3rd or 4th infra labials.

11. Supra labials four in number, the last one touching two scabs behind.

12. Colour—Belly uniformly whitish, dotted with light brown spots.

My specimen is a foot long.

The constituents of the poison.—The poison of the *Echis carinata* contains toxins affecting the nerve-cells not sufficient to cause paralysis. It also contains a substance, which depresses the vasomotor centre.

It also contains toxin which affects the blood making it more thin, destroying the red blood corpuscles with a loss of its coagulating power.

It also contains toxin which injures the living membrane of the capillaries. The above two poisons explain the spitting of blood and subcutaneous effusion of blood in the recorded case.

It also depresses the cardiac muscle.

My object in recording this case is to know what effects have been produced by injecting emetine hydrochloride? Was it useful in checking hæmorrhage? If so, I hope some investigator will kindly try further experiments.

PAKA OIL, IN MUSTARD OIL, AS AN ADULTERANT.*

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AND

DR. SATYENDRA NATH SEN, M.B.,
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In July last, our attention to this matter was first drawn by Dr. Satya Saran Mitra, of Howrah, who reported a few cases of illness showing symptoms of gastro-intestinal irritation accompanied by giddiness and a sense of general weakness and faintness, which came under his observation in Howrah and Sibpur. He suspected mustard oil with some new adulterant, used as food, to be the cause of this illness. Subsequently, several cases of a similar nature were reported in the newspapers, occurring in Calcutta and its suburbs, and some medical practitioners who saw the cases also suspected

adulterated mustard oil to be the cause of the illness.

Dr. Mitra was good enough to send us a few samples of the suspected mustard oil used in the suffering families and also a few seeds which he obtained from some oil-mills in Howrah, and which, he came to know, were being mixed with mustard seeds for the extraction of the edible oil, which is indispensable as an article of food in every Bengali house.

Almost simultaneously, Dr. Sasi Bhusan Ghosh, M.B., Chief Analyst to the Corporation of Calcutta, received information regarding the incidence of such cases and had reasons to suspect the use of bazar mustard oil to be its cause. We had a talk with him about this matter and he kindly sent us a quantity of seed, with some oil expressed from some more at the Indian Museum, for chemical and physiological experiments. These seeds were identified at the Museum as *Paka* seeds of the lac tree (Bot. name "*Schleichera trijuga*.") and the oil expressed from these seeds is generally known as Macassar oil, *Paka* oil or *Kusum* oil.

Botanical character and uses.—The plant *Schleichera trijuga* belongs to the natural order Sapindaceæ, to which the common Indian plant soap-nut or *Rita* belongs. It is known also as the "*Kusum*" tree of India, lac tree of Kosumba and Ceylon oak. In the Celebes, the seeds are known as Kosumbi nuts.

The wood of the tree is very hard, strong and durable like oak, hence it is called Ceylon oak. It is used all over the country for oil, rice and sugar mills and for agricultural implements and carts. Lac is produced on the young branches of the tree.

The fruit is a drupe of the size of a nutmeg, a little pointed, with a grey fragile husk covered with soft blunt prickles. The seeds are surrounded with a whitish pulpy aril having a pleasant acid taste. This pulp is edible and palatable. The dry seed is hard, of a brown colour, oval and smooth, length about half-inch at its longer diameter, with a pointed hylum at one of its ends, and a small depressed longitudinal mark on each side. The kernel occupies the whole of the interior of the shell and consists of a smooth body with a deep cut from the hylum close to the centre of the seed. On pressure, it yields an oily liquid of a bland odour.

As regards the structure of the seeds, they are made of hard, moderately thick external shells containing a kernel in the proportion of 2 to 3 by weight. The kernel yields 70.5 per cent. of a fat which is known in India as Kon oil, *Kusum* oil, *Paka* oil or Macassar oil.

Chemistry of the oil.—The oil, according to Lewkowitsch, is a yellowish white clear liquid which consists chiefly of the glycerides of lauric,

* Read at the Calcutta Medical Club, September, 1919.

palmitic, arachidic and oleic acids. It also contains small quantities of acetic and butyric acids. *Hydrocyanic acid in small proportions is always found present in the oil.*

LABORATORY EXPERIMENTS.

I. *Physiological experiments.*—

(a). An alcoholic extract of two seeds of average size was introduced into the stomach of a healthy cat.

Within half an hour, the animal vomited and became dull and apathetic. It soon recovered without showing any other untoward symptoms.

(b). 30 drops of the *Paka* oil supplied by Dr. S. B. Ghosh were mixed with a small quantity of starch emulsion and introduced into the stomach of a healthy adult cat, with an india-rubber tube and syringe, at 11-30 A.M. on the 21st August, 1919.

11-40 A.M. The animal, which was quite jolly and active, became very dull and then dropped down and lay quite helpless on the floor. There was salivation, and twitchings were noticed all over the body. The pupils were normal. The animal placed its chin on the floor and its breathing became quick and shallow.

11-50 A.M. Had severe tetanic convulsions. The animal appeared to be in extreme agony and passed water. Pupils were dilated, mouth open with the tongue protruding.

12 noon. The animal was lying in a paralysed condition. Dilatation of pupil passed away. It was getting occasional spasms of the head and the limbs and passed an involuntary stool of semi-solid consistence. Breathing became labourled and slow.

It remained in a comatose condition until death took place at 2-30 P.M.

Post-mortem examination.—Half an hour after death, the body was opened. There was absence of rigor mortis. The pupils were widely dilated.

The stomach was slightly congested. It contained about a drachm of a glairy brownish fluid mixed with a number of oil globules.

The small and the large intestines were normal. There was a quantity of semi-solid greenish faecal matter in the lower part of the large intestines.

The liver, the spleen and the kidneys were congested.

The lungs were also congested.

The heart was empty.

The blood had a peculiar bright red colour, sometimes seen in cases of hydrocyanic acid poisoning.

As the symptoms and the post-mortem appearances in the cat were strongly suggestive of hydrocyanic acid poisoning, the viscera were subjected to distillation with a small quantity

of diluted sulphuric acid and the distillate gave reactions of hydrocyanic acid.

The stomach-contents were separately distilled and reactions of hydrocyanic acid were obtained in the distillate.

These results led us to investigate into the chemical properties of the seeds and the oil.

II. *Chemical experiments.*—

(a) The powdered seeds were distilled with dilute sulphuric acid and the distillate gave well-marked reactions of hydrocyanic acid.

(b) The oil gave no reactions of free hydrocyanic acid. Its reaction is neutral and it is devoid of any characteristic odour.

The oil was distilled with dilute sulphuric acid; faint reactions of hydrocyanic acid were obtained in the distillate.

(c) The oil was saponified with alcoholic potash, acidified with dilute sulphuric acid and distilled. The distillate gave very marked reactions of hydrocyanic acid.

We made a quantitative estimation of the hydrocyanic acid present in the oil, which was found to be 0.3 per cent. as against 0.03 per cent., i.e., 10 times more than what has been recorded by previous observers.

(d) A drop of the oil taken in a test tube, shaken with alcoholic potash and heated, and a few drops of a solution of sulphate of iron and ferric chloride added to the mixture, turned deep blue (Prussian blue) when acidified with dilute hydrochloric acid. This test is quite good in detecting the presence of *Paka* oil in adulterated mustard oil, even when it is present in small proportions, when only a greenish-blue colour is obtained instead of the deep blue precipitate.

The *Reichert-Wollny value* of the oil was determined by us and it was found to be 21 c.c. N/10 NaOH (average of two experiments). The oil, therefore, contains a fairly large amount of volatile fatty acids (butyric and acetic).

The *butyro-refractometer value* of the oil at 40 deg. C. was found to be 51.

Composition of mustard oil.—The mustard plant belongs to the natural order Cruciferae. There are several varieties of mustard seed, black, white, red, etc. Besides the fixed oil, which is obtained by pressing the seeds and which is largely used in Bengal as an article of food, a kind of volatile oil is obtainable from the pressed oil-cakes, produced by the action of the ferment myrosin, on the glucoside called sinigrin (potassium myronate) present in the seeds. It consists almost entirely of allyl iso-thiocyanate with traces of allyl cyanide. This volatile essential oil of mustard possesses an intensely pungent odour and to it the blistering property of mustard is due. This oil is not ordinarily present in the expressed mustard oil. The fixed oil

contains arachidic acid, erucic acid and a liquid fatty acid called rapic acid.

The fixed oil which is used as food contains neither hydrocyanic acid nor any cyanide. Several samples of pure mustard oil were tested for hydrocyanic acid by us by similar methods as in the case of *Paka* oil and all gave negative results. The samples obtained from the Jail Depôt of Calcutta and from the Purulia Jail were found to give entirely negative results.

The Reichert-Wollny value of pure mustard oil was found to be practically nil (0.3 to 0.8 c.c.), and its refractive index as determined by the Butyro-refractometer at 40 deg. C. was found to be 59-60.

Analysis of adulterated mustard oil.—We had opportunities of examining five samples of mustard oil from Calcutta and Howrah, suspected to have caused poisonous symptoms. Three of these were forwarded by the police in connection with a case of illness occurring in the family of a Presidency Magistrate of Calcutta, one of which was actually used in the family and two seized by the police from the shop which supplied the oil to the family. The other two samples were sent to us by Dr. Satya Saran Mitra, obtained from families residing at Sibpur, showing poisonous symptoms after their use. The following table shows the results of analysis of these samples and also those of pure mustard oil and the *Paka* oil :—

SAMPLE.	Hydrocyanic Acid.	Reichert-Wollny Value.	Butyro-refractometer Value at 40° C.	REMARKS.
Pure Mustard Oil ...	Nil.	Practically nil ...	59	
<i>Paka</i> Oil... ..	0.3 per cent. ...	22 c.c. $\frac{N}{10}$ NaOH	51	
Police Mustard Oil No. I ...	Well marked ...	8.4 ...	54	Used in the Presidency Magistrate's house causing illness.
Police Mustard Oil No. II ...	Do. ...	Do.	54	Seized from the shop which supplied above oil.
Police Mustard Oil No. III ...	Nil.	Nil.	59	
Howrah Mustard Oil No. I ...	Well marked ...	8.5 c.c. $\frac{N}{10}$ NaOH	54	Forwarded by Mr. Satya Saran Mitra as producing illness in a family.
Howrah Mustard Oil No. II ...	Do. ...	9 c.c. ...	54	

Remarks.—It will be seen from the above table that four out of the five samples of mustard oil received for analysis in connection with cases of reported illness, were found to be adulterated with *Paka* oil and no doubt these, containing small quantities of hydrocyanic acid, produced symptoms of illness. The results of analysis of the two samples, one of which produced illness in the Magistrate's family and the other seized from the shop which supplied the

family with the oil, are identically similar and would leave no trace of doubt in any one's mind that *Paka* oil is being used as an adulterant of mustard oil, and this adulterated mustard oil is responsible for the causation of symptoms noticed in the persons using the same.

It has come to our notice that large stocks of these seeds are to be found in many of the oil-mills in the town and its suburbs. The mill-owners, when questioned about their presence in the mills, explain that the oil extracted from these seeds is being used for illuminating purposes. The fact that samples of mustard oil obtained from the bazar contain the *Paka* oil is a strong presumption that the seeds found in the oil-mills are being mixed with mustard seeds and the oil expressed from this mixture is being sold in the market as the edible mustard oil.

From the table of analyses below, it will be noticed that there is a good deal of difference in the composition of mustard oil and *Paka* oil. Hydrocyanic acid, probably derived from some form of cyanide glucosides, and the volatile fatty acids (butyric and acetic), which are altogether absent in mustard oil, are present in marked proportions in the *Paka* oil. The detection of these (hydrocyanic acid and the volatile fatty acids) in samples of mustard oil undoubtedly proves their adulteration with *Paka* oil. The lowering of the refractive index below 59 (that of pure mustard oil) would corroborate

such adulteration.

Action of hydrocyanic acid on animals.—The symptoms produced by hydrocyanic acid in a dog, as described in Blythe's book on "Poisons," are as follows :—

Evident giddiness and distress, tongue protruded, breath taken in short, hurried gasps, salivation, convulsions rapidly set in, passing into paralysis and insensibility. Involuntary expulsion of urine and faeces often precede death.

These symptoms were observed in the cat experimented upon with the *Paka* oil in our laboratory.

Hydrocyanic acid paralyses both the brain and the spinal cord, causing insensibility and loss of muscular power. Death from large doses occurs rapidly by syncope due to arrest of the heart's action, or, from smaller doses, less rapidly, by asphyxia due to paralysis of respiration.

Although vomiting and purging are not the usual symptoms of hydrocyanic poisoning in man, cases are on record where its use in small doses has been followed by nausea, vomiting and looseness of bowels. The gastric symptoms might be due to local irritation in cases where the narcotic symptoms are not so well marked. Nausea and vomiting may also be due to the centric action of the poison. In the case of Dr. S. Mookerjee, who felt very bad after taking his meal in which he used bazar mustard oil, he reported that he felt so giddy and faint that he was unable to get down to his laboratory from his car, but went back home and lay down quietly for a few hours before he completely recovered. His wife, who took the same oil, also suffered badly and vomited several times.

The presence of hydrocyanic acid in certain vegetable products is no new discovery. A few plants contain cyanides and many contain amygdalin (which is a glucoside) or bodies formed on the type of amygdalin. In the presence of emulsin, a ferment, or similar principles and water, this glucoside breaks up into hydrocyanic acid, grape sugar and other compounds.

Dunstan and Henry have discovered three such glucosides :—

(1) Dhurin in the young plants of the great millet (*Sorghum vulgare*, *makai*, *bhutta* or *janar*).

(2) Lotusin in *Lotus arabicus*, a legume indigenous to Egypt.

(3) Phaseolunatin in the leaves of the wild *Phaseolus lunatus*.

The following is a record of poisoning by the beans of *Phaseolus lunatus* (Kratok) described by Blythe :—

"In March, 1905, a steamer brought to Rotterdam a cargo of Kratok beans for the purpose of feeding cattle. A workman, employed in unloading, took some of the beans and gave some to a family. The workman ate some boiled beans. A few hours after, he felt unwell, became faint, had convulsions and died about 11 hours after the meal. The family, 6 in number (4 children and 2 adults), partook of the beans. All became ill three hours afterwards. Three of the children died; the rest recovered. The three children who died had no diarrhoea; those who recovered had diarrhoea. Hydrocyanic acid was detected in large quantities in the unboiled

beans. From the boiled beans, only traces could be obtained. Hydrocyanic acid was also detected in the viscera of the three children."

According to Lyon, the following plants with many others all yield, by appropriate treatment, more or less hydrocyanic acid :—

- (1) Bitter (but not sweet) almonds;
- (2) Apple and pear pips;
- (3) Plum;
- (4) Damson;
- (5) Cherry;
- (6) Peach;
- (7) Apricots;
- (8) Quince kernel;
- (9) Loquat seeds;
- (10) Root of *Jatropha Manihot* (Cassava arrowroot) in which hydrocyanic acid is present ready formed.

Some years ago, we had to deal with a case of cattle-poisoning in which the history was that some cattle after eating some grass took ill and died. The sample of grass was forwarded for analysis, and we detected hydrocyanic acid in the distillate obtained from the grass.

We have been receiving samples of suspected mustard oil and *Paka* seeds from various mofussil towns in Bengal and Bihar, reporting similar cases of illness following the use of such oil.

From the Civil Surgeon of Purulia, we have received 12 samples of adulterated mustard oil, in 8 of which we detected *Paka* oil. He also sent us a sample of oil expressed in his presence from *Kusum* seeds, which was found identical with *Paka* oil.

The form in which hydrocyanic acid is present in the oil is engaging our attention, and we hope to present the result of our investigation on some future date.

In conclusion, we beg to express our thanks to Dr. Hiralal Sinha, B.A., L.M.S., for helping us in the investigation, and to Dr. Satya Saran Mitra and Dr. Sasi Bhusan Ghosh, M.B., for supplying us with seeds and oil for our experiments.

P.S.—Since the reading of the above paper, we have received three samples of mustard oil from Ranchi, one more sample from Purulia, and one sample from Jalpaiguri, all said to have caused symptoms of poisoning as described above. *Paka* oil has been detected in all the samples.

The Sub-Assistant Surgeon of Padampur, in the district of Sambalpur, sent us two samples of *ghee* for examination in September last. The history of the case was that a local zemindar fed about 700 men with *poorees* and sweetmeats prepared with this *ghee*. Almost all the men suffered severely from headache, giddiness, vomiting and purging shortly after partaking the food. Both the samples of *ghee* were found to contain *Paka* oil. This shows that *Paka* oil is also being used for adulterating *ghee*.

A Mirror of Hospital Practice.

"CLINICAL CASES."

By N. S. NARASIMHAN, L.C.P.S. (Bom.)

Paraplegia after dysentery.—Patient Nihal-singh, aged 18, admitted on 21st February, 1919, with history of dysentery for 7 days. Temperature normal. Stool examination showed blood and mucus, and amœbæ. Patient was treated with emetine hydrochlor. injections, one grain a day from 22nd February, 1919.

February 28th.—Stools, neither amœbæ nor cysts. Emetine was stopped. Bismuth mixture continued.

March 12th.—Still frequent stools and pain in abdomen; patient very weak. Bismuth continued.

March 27th.—No diarrhoea; complaint of pain around the waist.

March 30th.—Weakness and loss of sensation of both the lower extremities. Knee jerks increased; no ankle clonus. Babinski's sign not present; other reflexes normal. No history or evidences of syphilis. Mist. pot. iodide with liq. hg. perchlor., one ounce, thrice daily.

April 8th.—Control over defæcation and micturition present; gait staggering; unable to walk or keep steady.

April 15th.—X-ray of lumbar and dorsal regions and pelvis normal.

April 30th.—Patient was found improving. Mixture pot. iodide continued with massage.

May 22nd.—Examination of urine and stools showed nothing abnormal. Wassermann test, negative.

Patient was able to move about with crutches. Still the muscles were flaccid. Patient's general condition improved very much. Patient was sent away on 2nd July, 1919. Probably the defect will remain as a permanent one.

An undiagnosed case.—Patient Govindaramji, aged 27, was admitted on 16th March, 1918. Patient complained of vomiting of two months' duration. Even milk and water were vomited.

March 19th.—Bowels constipated. Enema given and scybalæ were passed.

March 20th.—Enema given again and scybalæ were passed. Patient was on pot. bromide, 10 grains, thrice a day since 16th March.

March 21st.—Tincture of iodine, minim 1, every 2 hours. Enema given. Scybalæ with a mucous cast passed. Seen by a consultant and was put on gastric sedatives with cocaine hydrochlor., one-sixth grain, thrice daily.

March 23rd.—Vomiting frequent; patient refuses medicine and nourishment. Nutrient enema given. Patient's condition very low;

constantly vomiting; temperature sub-normal; pulse imperceptible.

8-45 P.M.—Strychnine and digitalin injection given. The surgical specialist thought that there was no surgical condition to be dealt with.

March 24th.—Vomiting dark-coloured fluid. X-ray examination under bismuth meal was suggested but could not be done as the patient was very weak. Stools—No blood; Vomit—No blood, Microscopic and Chemical Examination. Urine—A faint trace of albumin.

10-30 P.M.—Pulse imperceptible; patient conscious but in a low condition. Vomiting continuous of coffee-ground variety.

March 25th.—Nutrient enemata not retained. Sub-cutaneous saline infusion given.

March 26th and 27th.—Condition same; saline hypodermic injections and rectal feed continued. Temperature sub-normal; pulse very poor.

March 28th.—Patient died at 5 A.M.

Post-mortem examination was attended by the specialists as well. Nothing abnormal was noticed except some congestion of lungs (probably hypostatic).

The viscera was sent to the chemical analyser. No poison was detected. Nothing of any importance regarding his past history could be elicited.

A case of hæmaturia.—Patient Gowrajii, aged 30, was admitted on 4th June, 1917, for hæmaturia since 18th May, 1917. Had fever for two days in the beginning. Patient gave history of similar attack in 1914, with history of chyluria. Patient has never been out of India.

June 5th.—Urine examination showed albumin and abundant R. B. C. No bilharzia ova.

June 7th.—Severe pain in left kidney region with all symptoms of renal colic; relieved by morphia injection, probably due to the passing of a clot. Cystoscopic examination showed pure blood spurting out of both ureters; no stone in bladder; no ulceration. Temperature rose to 101 deg. F. Patient was sick, restless, and bladder had to be emptied by catheter, probably on account of clots.

June 10th.—Blood taken during night. No filaria.

June 14th.—Skiagraphed. Nothing particular noticed. Urine examination shows embryo of filaria sanguinis hominis.

July 4th.—Urine clear, no albumin, no R. B. C. blood. No filaria.

July 7th.—Urine: No chyle, no filaria.

July 13th.—Suddenly started hæmaturia with slight evening rise of temperature.

July 27th.—Urine clear.

August 14th.—Getting irregular rises of temperature; looking thin.

September 6th.—Temperature normal.

September 10th.—Cystoscopic examination: No cystitis; apparently nothing abnormal.

Patient was discharged on 15th September, 1917, but was readmitted on 9th October, 1917, for hæmaturia.

October 13th.—Urine examination: No filaria.

October 20th.—Still passing blood in urine.

October 21st.—Chyle and living filarial embryos present in the urine.

Peripheral blood examination taken at midnight: No filaria.

October 29th.—Patient was given 0.6 grain arsenobillon intravenously.

Peripheral blood taken at midnight was examined daily for a few days and showed filaria a fairly good number, and urine also had living filarial embryos. The futility of the drug in this disease is thus seen.

Patient now voluntarily gave a detailed history as follows :—

"He had salvarsan injection in 1913; six months after the injection he had the first attack of hæmaturia. Since 1913 he has had four attacks of hæmaturia, first in 1914, second in 1915, third in June 1917, and fourth now."

Patient was seen in active work by me in 1918, and early part of 1919. He has put on fat and is in apparently good health.

A case of double facial paralysis.—Patient male, aged 25. Patient was in hospital since 12th January, 1919, for giddiness and deafness.

January 24th.—Sudden complete facial paralysis, right side.

February 21st.—Sudden complete facial paralysis, left side.

February 23rd.—Had vomiting and complained of vertigo. Patient had no fits; knee jerks much increased; palate insensitive; deafness increasing.

February 26th.—Throat swab. No diphtheria bacilli. Pupils dilated, left more than the right.

Patient was examined by the specialist, who reported as follows :—"No disease of the ear—external, middle, or internal. Marked diminished sensibility of the palate. No paralysis of the palate. Pronounced laryngeal catarrh with redness and swelling of each vocal cord; slight adduction paralysis; statis tests show slight loss of power of equilibration."

The cause of laryngeal catarrh was obscure; patient had bronchitic signs in chest; sputum was examined repeatedly and no tubercle bacillus was found. Wassermann test was negative. Sense of taste: Normal. Patient was depressed and the cause of the condition could not be determined.

SURGICAL EMPHYSEMA, COMPLICATING INFLUENZA.

By I. C. AICH, M.B.,

Registrar, Medical College Hospital, Calcutta.

CASE I.—A Bengali boy, aged 4 years, was admitted on the 6th April, under Lieut.-Col. D. McCay, I.M.S., in the Medical College Hospital. The boy was suffering from fever and cough for seven or eight days before admission. The cough was very severe and three days before admission, during a fit of coughing at night, his neck began to swell. The swelling rapidly extended over the cheek and eye-lids to the forehead and spread also over the trunk.

On examination, we found the neck, the face, specially the eye-lids, the whole of the trunk, including the scrotum, greatly swollen. The hands were also swollen but not so much. The swelling extended also to the upper part of the thighs. The swelling of the eye-lids was so great that the child could not open his eye-lids, nor could we separate them to have a look at his eye-balls. On palpation, emphysematous crackling with deep dimpling was obtained on the swollen parts. On percussion, tympanitic notes were obtained, and on careful auscultation the breath sounds seemed to be diminished in the upper part of the chest and back. The heart was not displaced.

On X-ray examination Capt. J. A. Shorten found the left lung mottled and dull, there was no apparent air entry; the right lung was normal, except the apex, which was opaque.

The child was said to be free from fever for three days before the swelling began, but on admission his temperature, taken rectally, was found to be 100 deg. F. The temperature came down by steps to normal in four days and kept to normal till the child was discharged from the hospital on the twelfth day.

CASE II.—On the 14th of July, a Bengali, aged 26, was admitted in the Medical College Hospital, under Lieut.-Col. D. McCay, I.M.S., for the treatment of emphysema. On enquiries we learnt that the patient had an attack of fever and cough about 20 days before. The fever left him on the twelfth day and since then he was free of fever; but his cough is as bad as before. With the cessation of fever his neck and face began to swell. The swelling increased every day till it became very uncomfortable for him.

On examination we found about the same condition as in Case No. I, except that his right side was worse than the left; he could open and see with his left eye. The upper lobe of the right lung was collapsed. Examination under the X-rays by Capt. Shorten showed increased hilus shadows, especially of the right

side. The lungs showed little expansion with scarcely any movement of the diaphragm.

Both the cases did very well; case No. I was taken out of hospital after twelve days, cured. Patient No. II is still in hospital and is doing well. The emphysematous swellings are rapidly subsiding. The upper lobe of the right lung is expanding again and by the time this report will be published we consider the man will be completely cured and discharged from hospital.

The treatment we adopted was very simple. The cough was checked with opiates and the atmosphere about the patient was kept moist with steam and tinct. benzoin co. The heart was supported with stimulants when necessary and the patients were kept on good nourishing diets.

We have heard of similar cases from the Campbell Hospital, but, as far as we can make out, only one case has been reported in the *British Medical Journal* of 1918 (vol. II, page 686). It was a child who developed surgical emphysema about a fortnight after the onset of influenza; the emphysema coming on when the child was apparently doing well, and proving fatal in a very short time. The post-mortem examination showed a perforation, about a sixth of an inch in diameter, situated in the left bronchus, just behind the bifurcation of the trachea and apparently connected with a suppurating lymph gland.

CASE OF HYDATID CYST.

By GHULAM MOHAMMAD BUTT, M.B., B.S.,

Civil Surgeon, Kurram Valley.

AN adult Mohammadan male, aged about 35, came in with a swelling in the lower part of the abdomen with the following history:—

Duration one year. The swelling came on gradually, and when first noticed some six months back, he was quite indefinite about it, size, that of an orange. Since then it gradually increased to its present size. It was never painful and the only trouble he had had for the last two months was a sense of weight and frequency of micturition.

Examination:—A painless, tense, hard, globular swelling, fairly movable from side to side, extending from the pubes to within 2 inches of the umbilicus. The abdominal parietes are free above and the tumour is brought into marked relief when the patient lies down on his back.

The tumour was suspected to be fibroma of the bladder and on passing the sound it met

with some resistance at the neck of the bladder which gave a rotatory movement as if it were travelling over a bend. The patient was informed that the tumour was intra-abdominal and required surgical interference; this he flatly refused and left the hospital. After a fortnight he turned up again and consented to operation. On opening the abdomen below the umbilicus a glistening white granite-like mass was seen lying in the wound, which, on enlarging the incision, was found adherent with the bladder and pelvic colon. The breaking of the adhesions and lifting of the tumour revealed it to be a hydatid cyst of the peritoneum which was removed entirely by freeing it from the posterior pelvic wall. After securing the bleeding points the bladder was distended with fluid and, finding everything satisfactory, the abdominal wound was closed. The patient, except for some stitch suppuration made an uninterrupted recovery. The cyst is kept as a specimen and measures $5\frac{1}{2}$ inches in diameter. I shall feel obliged if any of your learned readers would inform me through the medium of your valuable paper the size of the biggest hydatid cyst ever removed from the peritoneum.

A CASE OF ECTOPIC GESTATION WHICH BURST INTO THE RECTUM.

By ELEANOR B. WOLF, M.D.,

Guntur, India.

IN the *Indian Medical Gazette* for August, 1919, there was reported a case of ectopic gestation which had burst into the rectum. The comparative rarity of such cases leads me to report a similar case which came under my observation a few weeks ago.

The patient, an ignorant country woman, admitted on the 7th of August, 1919, gave the following history:—

Complaint.—Abdominal pain and obstruction in the rectum.

Past history.—She had one child sixteen years ago, which died shortly after birth. From that time until three years ago, she did not become pregnant and her menses were normal. Three years ago, she had cessation of menses for two months when suddenly she had a very acute attack of pain in the lower abdomen and slight red vaginal discharge. The pain gradually passed off and, as far as we could ascertain, she was not very ill at that time. From that time on she again had suppression of menses and she noticed that her abdomen was getting larger. During this time she had slight intermittent abdominal pain. Soon she felt movements and her relatives said she was pregnant. This condition lasted until the ninth month when she had severe pain again, with tightness of abdomen, but when labour did not set in, her relatives said it was an "air tumour"

and began to give her native medicine to "melt" it. In the course of several months her abdomen gradually decreased in size and her menses were re-established. Slight abdominal pain, however, persisted in the lower abdomen. She was in comparatively good health until six months ago, when she began to have frequent stools which at length became mixed with blood and mucus and had a very offensive odour. She took native medicine until a few days before admission to the hospital, when she felt something obstructing the rectum.

The patient was seen in the out-patient department. At that time the vaginal examination showed a relaxed outlet, a firm and enlarged cervix induration and indefinite masses in the cul-de-sac and both fornices. It was impossible to outline the uterus. Rectal examination at that time showed a sanio-purulent fecal discharge with a most offensive odour and large external hæmorrhoids. On introducing the finger a sharp cutting edge of a flat bone was felt and removed with some difficulty. This seemed to be a portion of a foetal skull. The patient was then admitted to the hospital.

The patient was kept under observation for several days, douches and rectal irrigations being given, but no more bones were passed. Her general condition was good, her only complaint being slight abdominal pain and the offensive character of her stools of which she had one or two daily.

August 14th.—The patient was given chloroform. At this time the vaginal examination was practically the same as on admission. Rectal examination, however, revealed the following interesting features: There was still an offensive discharge and about three inches from the external sphincter the examining finger felt, a little to the right of the mid-line, a mass of bones which apparently extended from the cul-de-sac into the right wall of the rectum. These were gradually removed with the fingers. A large blind sac with irregular edges was then found opening into the right rectal wall. Vaginal examination after the operation showed that the bulging mass in the cul-de-sac had disappeared, there was still some induration in both fornices and the uterus was in good position, a little larger than normal with slightly restricted movement on the right. The patient stood the operation well and made an uninterrupted recovery.

August 22nd.—Rectal examination showed the opening into the rectum much smaller, not at all painful, and there was scarcely any odour or discharge of any sort. The patient was in good condition and asked for leave to go home.

During her stay in the hospital her highest temperature was 100.4 degrees and her highest pulse was 120, which was her pulse on admission and immediately after the operation.

Description of bones.—Four very thin cranial bones, the largest, the occipital bone measuring 5 by 3.5 cm., 22 ribs, the longest one 5 cm., both femurs 5.5 cm., both tibiae 4.5 cm., 5 smaller long bones hard to differentiate, both iliac bones 2 by 2 cm., both scapulae, 9 small vertebrae, 14 bones imperfect and difficult to determine, in all 62 bones.

MEDICAL SERVICE IN INDIA.

THE following public announcement has appeared in the London papers. The terms offered to those willing to accept commissions in the Indian Medical Service, will be of interest to a very considerable number of our readers. The offer made in paragraph VI is a distinct advance, and should go far to induce men of the right stamp to accept service in India :—

INDIAN MEDICAL SERVICE.

I. The Secretary of State for India announces that 204 medical men are urgently required to fill vacancies in the Indian Medical Service. Of these two-thirds (136) will be Europeans and the remainder Indians. The appointment of European candidates will be made by nomination on the recommendation of a Selection Committee in England. Applications from Europeans, and from Indian candidates resident in this country, will be received at the India Office. Applications from all Indian candidates will be considered together.

II. Appointment will be by nomination on the recommendation of a Selection Committee. Candidates must be over 21 and under 32 years of age at date of application.

III. Preference will be given to candidates who are or have been serving with his Majesty's Forces during the war.

IV. All service rendered as a medical or combatant officer, or in a position usually filled by an officer, during the war will count both for promotion and pension on appointment to the service, but not for the gratuity mentioned in paragraph VI below.

V. The scale of pay, which has recently been greatly increased, is set out below. A lieutenant on appointment now receives Rs. 550 a month (equivalent at the present rate of exchange, the continuance of which cannot be guaranteed, to £605 per annum). Those who have had three years or more previous service will enter in the rank of Captain on Rs. 700 a month (or £770 a year).

VI. An officer who is appointed to the Service in 1919 or 1920 may claim to retire on a gratuity of £1,200 on completion of eight years' service from date of permanent appointment, provided he has given notice of his intention to retire 18 months before the date of retirement. An officer so retiring will also be eligible for a free return passage to Europe, if claimed within three months of retirement.

VII. Application forms and any further particulars desired can be obtained from the Secretary, Military Department, India Office. The correspondence should be clearly marked on the top left-hand side of the envelope "Medical Recruitment."

[The scales of pay on the Military and Civil sides of the Service are published under Service Notes in the present number of this Gazette.]

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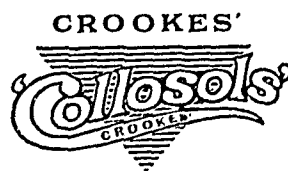
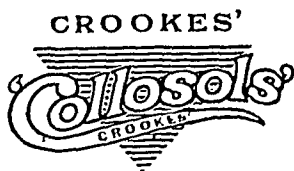
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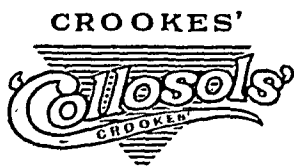


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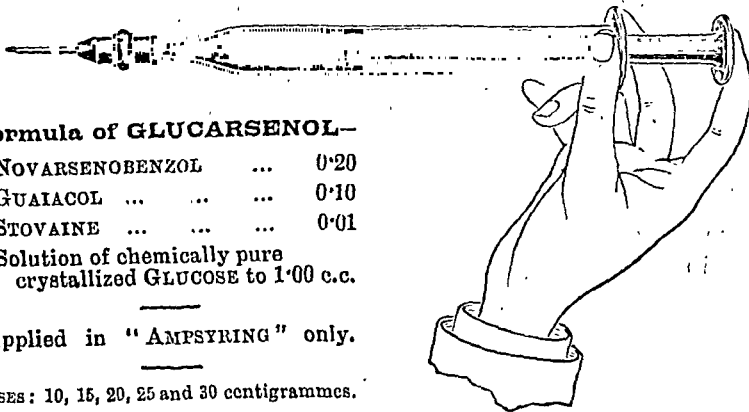
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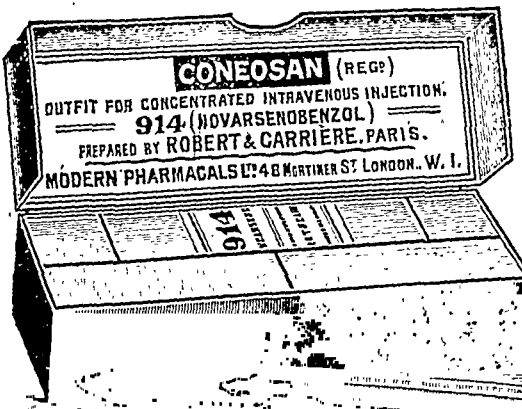
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Indian Medical Gazette.

NOVEMBER.

THE MODERN THEORY OF RENAL EXCRETION.

THE great number and variety of substances found in the blood and urine makes it seemingly impossible that urine excretion depends on chemical combinations within the renal cells, and suggests a physico-chemical mechanism to explain the phenomenon.

The problem of how the kidney fabricates a highly concentrated solution of salts from a dilute solution of the same salts in the blood plasma is complicated by the fact that the ratio between the concentration of each urinary salt in the urine and that of the same salt in the blood is by no means constant. The urine is not a deproteinised blood plasma.

While it has not been possible to determine the nature of the forces which operate, it is possible to postulate that they function by one of two mechanisms :

(1) *Physical theory*.—That the urine is a filtrate of the blood which has passed through a portion of the renal epithelium into the tubules as a very dilute fluid, *i.e.*, a deproteinised blood plasma, and that the dilute fluid is concentrated by absorption by physico-chemical forces by other cells of the kidney and the fluids and salts replaced in the blood.

(2) *Vital theory*.—The other mechanism would have it that the salts and water are each actively excreted by the various cells of the kidney epithelium.

Both these theories are inadequate to explain the phenomena of urinary excretion, but they have served to develop what Cushney terms "the modern theory of urinary excretion."

The modern theory accepts the general scheme of filtration and reabsorption of the physical theory, but pays due respect to the fact that the known physical forces are not adequate to explain the reabsorption that must take place to produce the concentration of the salts found in the urine.

It, therefore, supplements the physical theory by assuming a vital activity on the part of the epithelium of the tubules in reabsorbing fluids and salts from the dilute filtrate coming from glomerulus and capsule.

Cushney's modern theory is as follows:—

A large amount of blood plasma fluid is filtered through the glomerulus into Bowman's capsule, the filtering force being the blood pressure. This fluid has the same concentration of the salts to which the capsule is permeable as has the blood plasma. The blood leaving the glomerulus is a somewhat concentrated solution of plasma colloids, and must have returned to it the proper amount of fluids and salts to keep it an optimum fluid for the body cells.

This is accomplished by active absorption of part of the glomerular filtrate by the cells of the tubules.

The salts that are of no use in the body are not reabsorbed and, therefore, appear in a highly concentrated form in the urine. These salts are called "non-threshold substances," and, since their presence in the plasma is unnecessary, they continue to be excreted so long as they are present in the blood.

The salts that are necessary are termed "threshold substances" and are reabsorbed until they are again present in the blood plasma in the optimum amount. Urea, for instance, continues to be excreted as long as any is present in the blood, while glucose is completely reabsorbed so long as its concentration remains under a more or less fixed level.

To produce 1,200 c.c. of urine containing 20 grammes of urea, 60 litres of blood plasma of .02 per cent. urea are filtered and 58.8 litres of water reabsorbed.

Five hundred litres of blood flow through the kidney vessels daily, so that only about 13 per cent. would pass by filtration through the capsule of Bowman. The seemingly large amount of water, which the tubules would have to absorb per day, is small when the large number of the tubules is considered; it is estimated that each tubule would not have to reabsorb more than .01 c.c. per hour.

That the capsule acts as a filter is evidenced by the fact that it is possible to alter the rate of urine excretion by varying the difference between the pressure of the blood and the pressure of the urinary filtrate, by altering the character of the membrane of the capsule, and by changing the character of the blood. Thus, increase in urinary excretion follows on a rise of blood pressure that is brought about by ligation of several branches of the aorta, and decrease in the excretion of the urine follows on a fall of blood pressure caused by compression of the renal artery.

Increase in the blood pressure alone, without at the same time increasing the flow or volume of the blood through the kidneys, apparently does not increase urine excretion. This is explained by the fact that any notable increase in the concentration of the colloids in the plasma increases the osmotic pressure of the blood, which acts in opposition to that of the blood in the capillaries. Starling showed years ago that the secretion of urine ceases when the capillary pressure in the glomerulus falls below that exerted by the osmotic pressure of the blood proteins, the critical pressure being from 30 to 40 mm. of mercury. He further showed that when the osmotic pressure of the blood proteins was reduced, by dilution of the blood with saline solution, the rate of excretion was increased; if the dilution of the blood was made with saline containing gelatine, the diuretic effect was greatly increased. These experiments indicate that saline produces its diuretic effect by diluting the plasma proteins and lowering their osmotic pressure.

The modern theory of renal excretion explains very rationally the polyuria of diabetes—this polyuria being due (1) to the excessive amount of water taken, and (2) to the inability of the kidneys to concentrate the urine against the osmotic pressure offered by the concentrated sugar solution in the tubules,—sugar being a non-threshold substance, none of it would be re-absorbed.

Albuminuria from renal disease and cardiac failure would be explained by the modern theory as being due to a change in the permeability of the filtering membrane.

WOUNDS INFECTED WITH BACILLUS PYOCYANEUS.

INFECTION with *B. pyocyaneus* is probably much more common than is generally realized. This was certainly the case among the hospitals at the base in Mesopotamia. If frequent dressings are carried out, particularly with such lotions as eusol or Dakin's solution, the blue or green colouration of the pus may be absent. It is in breaking-down and necrotic bone and in the recesses under unhealthy skin that the organism thrives best and produces its characteristic blue-green pus. Though not acutely toxic or rapidly spreading in character, *B. pyocyaneus* suppuration is apt to be very resistant to ordinary antiseptics, and, as a secondary infection, it may prove most intractable.

"Notes on the treatment of wounds infected

with *B. pyocyaneus*" is a contribution to the subject by Major Philip Turner and Captain G. Richardson, R.A.M.C. (*Journal of the Royal Army Medical Corps*, May 1919.) They describe the characters of a pyocyaneus-infected wound and show how resistant the organism is to various antiseptics, including eusol baths and eusol soaks. The authors state, however, that, if really hot eusol fomentations are employed, this type of suppuration is rapidly controlled. The treatment laid down is as follows:—

1. If clinical evidence is not sufficient, a specimen of pus is sent for bacteriological examination.

2. In the case of a sinus or deep recess, use eupad powder moistened with eusol and apply fomentations.

3. Continue the fomentations for several days after the coloured pus has disappeared and no musty odour remains; test the wound frequently by bacteriological examination.

NOTICE.

Contributors are requested to send MS. of articles for publication type-written.

Current Topics.

CALCIUM CHLORIDE AS A PALLIATIVE AGENT IN THE TREATMENT OF INTESTINAL TUBERCULOSIS.

Journal of the American Medical Association, June 28, 1919.—FISCHBERG.

AFTER referring to the unsatisfactory results of the usual methods of treating this distressing complication of pulmonary tuberculosis, Dr. Fischberg gives his experience of Saxtorph's method. This writer recommended the injection of calcium chloride solution intravenously in such cases. The usual dose is 5 c.c. of a 5 per cent. solution. In some cases Saxtorph's results were fully confirmed, one injection reducing the daily number of motions from 10 or 12 to 2 or 3, and bringing about general amelioration of symptoms which had lasted for two to three months. In other cases the treatment failed utterly; repeated injections gave no relief.

Dr. Fischberg considers that the treatment is only effective in cases of early intestinal tuberculosis.

"When the diarrhoea in a tuberculosis patient is due to dietetic indiscretions, to the catarrhal condition of the intestinal mucous membrane, or to a slight intestinal ulceration, an intravenous injection of 5 c.c. of a 5 per cent. solution of calcium chloride will give prompt relief. When, however, the intestinal symptoms are due to extensive ulcerations—

especially to amyloid infiltration of the intestine—the chances of attaining relief of the pain, and annoying diarrhoea, are remote. Similarly, when the abdominal pains are due to irritation of the intestinal mucous membrane by the contents of the intestine, relief may be attained by intravenous injection of calcium chloride. When, however, the pains are due to localized peritonitis over deep intestinal ulcers, or to peritoneal adhesions, which are not uncommon in tuberculous subjects, calcium chloride is impotent to give relief."

The mode of action of calcium chloride can only be surmised. Loeb found that calcium salts stop contact irritability of muscle, and the hypersensitiveness of the nervous system induced by various salts. It has also been found that calcium salts impede and even stop completely intestinal peristalsis and may counteract the action of certain laxative drugs.

UNILATERAL ANÆSTHESIA OF THE CORNEA AND CONJUNCTIVA. A DIAGNOSTIC SIGN OF COMA DUE TO HEMIPLEGIA.

Journal of the American Medical Association,
June 21, 1919.—E. D. FRIEDMAN, M.D.

DR. FRIEDMAN refers to the difficulty in distinguishing coma due to various conditions, such as the post-epileptic state, uræmia, toxic conditions (for instance, alcohol), or hysteria. Unilateral diminution of the abdominal reflexes, long considered as an important sign, is often difficult to elicit.

It is well to remember that the corneal reflex is a consensual reflex. It can be elicited by carefully passing a small blunt object along the conjunctiva to the corneal margin. The reflex is absent on the side of the hemiplegia in practically all hemiplegias, with or without coma.

As to the cause of the abolition of the reflex, Milian attributed it to lesion of the facial nerve. The writer disagrees with this conclusion for two reasons:—

1. The consensual reflex should still be present on the other side if there be no anæsthesia of the cornea on the affected side.

2. It has been possible to elicit the reflex on the paralysed side by stimulating the cornea on the healthy side.

It is therefore considered to be due to anæsthesia of the cornea and conjunctiva caused by interference with the sensory paths in the brain.

BLOOD CHEMICAL METHODS IN DIAGNOSIS AND PROGNOSIS.

New Orleans Medical and Surgical Journal, Vol. 71, No. 2, May 1919.—R. B. H. GRADWOHL.

THE blood chemical methods mentioned by the author entail a search mainly for the products of non-protein nitrogenous metabolism, viz., urea, uric acid, creatinin, and sugar. The quantitative normals which have been estab-

lished are, in terms of 100 c.c. of blood, as follows:—

Uric acid	.. 1 to 3 mg.
Urea nitrogen	.. 12 to 15 mg.
Creatinin	.. 1 to 2.5 mg.
Sugar	.. .08 to 0.12 per cent.

Uric acid is the most difficult and creatinin the easiest of these substances to be eliminated. Consequently when kidney function is impaired the first substance to be retained is uric acid. Then as the disease progresses there is retention of urea, and finally the excretion of creatinin is blocked. When this last condition is marked—5 mg. per 100 c.c. or over—a fatal prognosis can safely be given, regardless of the apparent good condition of the patient.

Estimation of uric acid in the blood helps us to distinguish between gouty and other arthritic conditions; in gouty conditions the uric acid is increased to from 3.5 mg. to 25 mg. per 100 c.c.

Blood chemistry also helps us to distinguish in uræmic cases (with albumen and casts in the urine, high blood pressure and severe cardiac symptoms) between those which are primarily renal with cardio-vascular complications, and those which are essentially cardio-vascular. In the former case there is marked accumulation of non-protein nitrogenous ingredients.

In the case of glycosuria a determination of the sugar in the blood will help to distinguish true diabetes mellitus in which the blood sugar is always increased from renal glycosuria in which there is no such increase.

In connection with acidosis we are now aided by:—

(1) The Van Slyke method of estimating the absorption power of blood plasma for carbon dioxide.

(2) Marriott's methods for determining the hydrogen ion concentration of the blood and the alkali reserve of the blood plasma.

(3) The determination of the carbon dioxide tension of the alveolar air according to Fredericia's technique.

(4) More recently Marriott, Hæssler and Howland have drawn attention to retention of acid phosphates in the blood in acidosis, and have elaborated a "micro" method for its determination.

[Note: A simpler and equally accurate method is that of Shorten, *Indian Journal of Medical Research*, April, 1918.]

These observers found the normal figure expressed in terms of phosphorus to be from 1 to 3.5 mg. per 100 c.c. blood. [Shorten's figures for healthy Bengalis are: 1.6 to 4.36 mg. per 100 c.c. blood expressed as phosphorus.]

In nephritic acidosis they found as much as 23 mg. per 100 c.c.

As regards technique: the blood is taken from a vein in the arm as for a serological test, and received into a bottle prepared by adding and drying in the bottle overnight ten drops of a 20 per cent. solution of potassium oxalate. The sugar is estimated by Lewis and Benedict's

method; creatinin by Folin and Denis' method; uric acid according to Marshall's urease method. To complete the examination the non-protein nitrogen, cholestrol and total solids may be estimated by the usual methods. Acidosis tests are only carried out when there is fear of this complication arising.

Respecting the value of Geraghty and Rowntree's pthalein test, the writer says he has been much dissatisfied—

(1) Because its principle does not necessarily reside in an estimation of true kidney function.

(2) Because it has repeatedly failed in practice to give reliable information, and the results did not agree with blood chemical findings in cases where operative procedure on perfect convalescence proved the latter to be correct.

THE ACID-BASE REGULATING MECHANISM IN ANAESTHESIA.

American Journal of Surgery, July 1919.—
STANLEY P. REIMANN, M.D.

ACIDOSIS does not play a part in the pre-operative or post-operative history of the average surgical patient, but there is always an increase in the amounts of acid substances formed during and as a result of anaesthesia.

Acidosis means insufficient alkali. Ordinarily the alkali reserve is sufficient to neutralise a decided increase in acids up to a certain point. This we may call *compensated acidosis*. *Uncompensated acidosis* on the other hand is due to deficient alkali reserve or excessive production of acids; that is, the condition in which the bodily supply of alkali is depleted to a point where symptoms occur.

The analytical data on which the writer's conclusions are based have been furnished mostly by estimations of the amount of bi-carbonate in the blood. In normal individuals 100 c.c. of plasma yield *60 to 95 c.c. of carbon dioxide, and this is derived practically entirely from bi-carbonate. The reduction in the bi-carbonate which has been found to occur after anaesthesia and operation, averages 5 to 15 c.c. of carbon dioxide per 100 c.c. of plasma. This would not reduce the carbon dioxide figure below 50 c.c. which may be accepted as the lower limit of compensated acidosis.

Two views are held as to the cause of the reduction in the bi-carbonate content of the blood:—

(1) Henderson and Haggard hold that the bi-carbonate content is reduced by the blowing off of an excessive amount of carbon dioxide through the increased rate and depth of the respirations during anaesthesia. This would cause a relative increase in the alkali of the blood, which is tolerated as badly as increased acidity. To compensate for this there is a movement of alkali from the plasma to the tissue cells.

(2) The second view, and the one which is generally held, ascribes the reduction in bi-carbonate to an increase in acid substances in the blood. As early as 1908 Reicher showed that there is an increase in the ketone bodies (acetone, diacetic acid and β -hydroxybutyric acid) in the urine after anaesthesia. There is also direct evidence that these ketone bodies are increased in the blood. The writer in conjunction with Bloom has shown that 60 per cent. of the observed fall in carbon dioxide content of the plasma is accounted for, molecule for molecule, by these ketonic acids, estimated as acetone. Furthermore it has been repeatedly shown that oxidation is diminished, during anaesthesia, and it is well known that the so-called ketone bodies are products of incomplete oxidation.

"It can be definitely stated that oxidation is diminished somewhere between the oxygen in the blood and the oxidizable substances in the cell. Further, interference with oxidation is so intimately associated with the anaesthetic agent, that to prevent sub-oxidation is to prevent anaesthesia. The protection of the patient against acidosis must, therefore, reside in supplying the body with alkali."

"Further studies confirmed, what had been demonstrated before, that the ammonia and titrable acidity of the urine were increased after anaesthesia. To put it briefly, these acids are neutralized as they are formed by sodium bi-carbonate and ammonia, and then probably, for we have only begun these analyses, by other available but less easily mobilised bases such as calcium and magnesium. The salts of the acids are then excreted and thus eliminated from the body."

As regards the symptoms of acidosis it is difficult to separate these *per se* from those caused by the pathological condition underlying the disease; uncompensated acidosis is practically always an accompaniment of some grave pathological condition. It may, however, be stated that patients suffering from uncompensated acidosis exhibited an increase in nausea, vomiting, and headache, and took a longer time to recuperate than patients with compensated acidosis.

With regard to determining factors, sex and age were found to have little or no effect. Definite determining factors are:—

1. Impaired kidney function.
2. Diseases which tend to drain the body of its alkali reserve such as long continued infectious processes.
3. Duration and depth of anaesthesia—the longer and deeper the anaesthesia the greater the demand for reserve alkali.
4. Starvation prior to operation.
5. Presence of shock due to hæmorrhage.
6. Low alkali reserve from other causes.

Treatment.—If we accept the view of Henderson and Haggard that the symptoms are due to over-ventilation and consequent depletion of CO_2 in the blood, it would be logical to give carbon dioxide to keep the acidity up to a given

* This is higher than the usual figures accepted by physiologists, viz., arterial blood 40 c.c. and venous blood, 56 c.c.

stimulating point. If, on the other hand, we realise, what has been abundantly proved, that there is an addition of acid substances to the blood, the administration of CO_2 would not only be illogical, but actually harmful. As already explained, the correct treatment must, therefore, reside in supplying the body with alkali.

Summary and conclusions.—The much discussed subject of acidosis in surgery has been investigated, and by a correlation of results of various analytic data, the following statements can be definitely made.

There is an increase of acids in every patient anaesthetised by ether, chloroform, and nitrous oxide. Intrapleural anaesthesia by stovaine produced quite a marked increase in acids in one case, which has come under our observation. This increase does not reach a stage where true acidosis is produced in 80 per cent. of cases. In 15 to 20 per cent. of cases it does.

Estimations of the bi-carbonate content of the blood plasma give information of acidosis in anaesthesia as well as in other conditions.

The condition under which acidosis in anaesthesia will appear have been mentioned.

Conclusions.—It is recommended that estimations of the bi-carbonate content of the blood plasma be made freely for the comfort of operative patients. When the pathology of the patient is grave, and of long standing, when the operation is likely to be lengthy, serious one, when there is, or is likely to be hæmorrhage, or when there is possibility of shock, it is not only advisable for the post-operative comfort, but imperative for the safety of the patient that these estimations be made.

To state it dogmatically, whenever a patient before operation shows a bi-carbonate content of 58 c.c. or less, alkali should be given. The use of sodium bi-carbonate in this connection is well known. The question may be asked, however, if other alkalies will not serve the purpose better. There are certain possible theoretical reasons why this may be so, but no experimental knowledge is available on this point, and therefore it cannot be pressed. However, it may be emphasized that too much alkali may do harm. The ease with which this can be determined, as well as the opposite condition of deficiency, renders the matter quite simple. A second analysis of the blood, two hours after administration of alkali by mouth, will indicate whether the desired result has been effected.

The management of operative cases from the standpoint of acidosis can now be said, therefore, to rest on a very definite and safe foundation.

RELATION OF PULSE PRESSURE AND KIDNEY FUNCTION TO OPERATIVE PROGNOSIS.

American Journal of Surgery, Vol. XXXIII, No. 7, July, 1919.—POLAK.

In this paper Dr. Polak discusses the clinical value of pre-operative pulse pressure, and its

relation to kidney function in the operative prognosis of gynaecological patients.

The following pre-operative routine was adopted:—

On admission the systolic and diastolic blood pressure is taken in the recumbent posture, and the difference—the pulse pressure noted as *at rest*. After two minutes' flexing and extending the arms in a sitting posture the pressures are again noted and recorded as after *moderate exercise*. The patient is then made to stand up and raise a pound weight from the floor to above her head several times. The heart action is, of course, accelerated and the systolic pressure raised, but if the heart muscle is of good quality little or no change is noted in the pulse pressure.

The sulphophenolphthalein output is then estimated, and it was found that with an average of 35 mm. of mercury for the pulse pressure the phthalein output for two hours' averages 60 per cent. If the phthalein reading is low the pulse pressure must be relatively high to compensate for the diminished renal function. If the phthalein reading is low (20 to 30 per cent.), and the pulse pressure also low, the patient has usually proved a poor operative risk.

Further observations were made to determine the effect of ether anaesthesia on renal function. These included pulse pressure observations during and after anaesthesia, coupled with frequent pulse counts. A complete blood count and hæmoglobin estimation was also made immediately on return from the operating room. This detail enables the observer to distinguish between shock due to hæmorrhage, and post-operative cardiac dilatation.

The first phthalein estimation is made six hours after operation. A catheter is left in place for two hours. It was noted that notwithstanding the diminished urinary output which always follows the administration of ether in the first few hours, there is only a negligible change, usually not over 10 per cent. in the phthalein eliminated, provided the pulse pressure has remained normal.

Two cases are quoted where there was a marked discrepancy between pre-operative and post-operative phthalein readings accompanied by greatly diminished urinary secretion, as a result of injection of morphia. The effect, however, was only temporary.

Conclusions.—1. That the pulse pressure is a test of the muscular strength of the individual woman's heart, when endocardial lesions can be excluded.

2. That the efficiency of the kidney function is directly dependent on the cardiac force of the individual, provided the kidney structures are normal or approximate the normal.

3. That ether anaesthesia of an hour does not disturb the relation of pulse pressure to kidney function unless the operation is accompanied by considerable blood loss.

4. That when the pre-operative kidney function is low the pulse pressure must be relatively high to compensate for the deficiency, as it does

no good to add saline by skin, bowel, or infusion unless there is sufficient cardiac strength to take it up and carry it along.

5. That when both the pulse pressure and phthalein output are low the operative prognosis should be guarded.

6. That morphin in large doses during operation seems to help in diminishing the shock but has a definite effect in diminishing the kidney output.

ANAPHYLAXIS.

FROM THE "PRESCRIBER," AUGUST 1919.

For an explanation of the meaning of the word "anaphylaxis" we cannot do better than quote from a recent number of the *J. A. M. A.*:—"By the word 'anaphylaxis' is understood generally the more severe phenomena that appear when an animal previously influenced ('sensitized') by a foreign protein, introduced into the blood and tissues by injection or otherwise, after a suitable interval again receives the same protein into its blood and tissues as the result of injection or otherwise. Anaphylactic shock in the guinea-pig is the classical example. As these phenomena are regarded currently as the result of an intoxication with the products of protein splitting, anaphylaxis may be looked on as a protein intoxication occurring when a prepared animal receives the proper protein into its system.

"At first the word anaphylaxis was used to describe the condition in which severe, violent phenomena occur on reintroduction of toxic proteins (eel serum, actinea poison) in animals previously injected with these substances for purposes of immunization. This was contrary to expectation; the previous injections, it had been assumed, would produce a condition of protection, a prophylaxis; as the directly opposite action resulted, the word anaphylaxis, meaning the reverse of prophylaxis, was coined to designate the condition. Before long, hypersusceptibility was introduced as synonymous with anaphylaxis. As a clearer insight into the nature of the condition was gained, especially through the work of von Pirquet on serum disease in man, it developed that in reality it does not concern the reverse of prophylaxis or hypersusceptibility to poisonous substances, but a change in the powers of the body to re-act on the introduction of foreign proteins. In order to indicate the nature of this conception, von Pirquet coined the word 'allergy,' which means altered reactivity. At present there is general agreement that phenomena as different as the experimental anaphylactic shock in guinea-pigs, the various manifestations, mild and severe, of serum disease in man, various 'food idiosyncrasies,' such as egg asthma, poisoning by cow's milk, etc., and the tuberculin and similar reactions, are all due to an altered reactivity of the body, altered by previous influence of the foreign proteins concerned on the antibody-producing tissues, so that when the conditions are right the foreign proteins are broken up in such a way as to produce poisonous effects that manifest themselves in different ways, depending on quantitative and other relations. Hence the word 'allergy' would appear to be the best word we have for the condition, because there is in reality no increased susceptibility to any particular poisons, nor is it true that the reverse of prophylaxis exists, because the allergic (anaphylactic) phenomena are the result of reactions between antibody and antigen, incidents, so to speak, in the course of immunization. Accordingly, anaphylaxis, hypersusceptibility, and allergy are being used more and more as synonymous terms, anaphylaxis being applied perhaps more to the severer general symptoms, of which anaphylactic shock is the classical example, and allergy to the milder phenomena illustrated by ordinary serum disease, tuberculin reactions, gonococcal reactions, etc. From what has been said, we see that anaphylaxis, although applied to the same sort of phenomena as when introduced by Richet, no

longer has the interpretative significance of its derivation and first usage."

BLOOD TRANSFUSION.

The Hospital, August 2nd, 1919.

An outline of the technique is given.

PRIMARY HÆMORRHAGE.

As regards indications severe primary hæmorrhage stands first.

According to Makins:—

"While it may be stated that blood is the best fluid with which to replace lost blood, yet in practice this may be both impossible and unnecessary. With a moderate hæmorrhage there is no need to replace the lost blood artificially. If the bleeding has been severe the loss can be made good by a more easily obtainable fluid, i.e., Bayliss's 6 per cent. gum-arabic solution. A still more severe hæmorrhage will demand blood."

A critical point is reached:—

1. When the hæmoglobin content falls as low as 30 per cent.
2. When the systolic blood pressure is below 80 mm. of mercury.

It may be laid down that,—

- (a) In abundant and sudden bleeding immediate transfusion of blood is needed.
- (b) In less severe cases, gum solution may be tried, and if no permanent good results from it, then follow up with transfusion.
- (c) The mildest cases should be given fluids by mouth or rectum.

SECONDARY HÆMORRHAGE.

Blood transfusion is the best method. In the case of generalised infections, the healthy donor may first be immunised against the specific casual organism and transfusion then carried out with marked benefit quite apart from any hæmorrhage.

ANÆMIAS AND OTHER CONDITIONS.

Good results are reported in pernicious anæmia and the ordinary secondary anæmiæ. No success has, however, been obtained in the leukæmic and lymphatic types.

TECHNIQUE.

(a) Direct transfusion.

This method should be abandoned, as it is impossible to tell how much blood has passed in a given time.

(b) Transfusion of unmodified blood. Kimp-ton's technique is as follows:—

A glass cylinder of about 500 c.c. is drawn out to a cannula-point below. To the top is attached a small hand-pump (rubber), which, when the cannula is inserted in the donor's vein, sucks up the blood, and, when in the receiver's vein, drives the blood out again at any required speed. The cylinder is sterilised and paraffin filmed by boiling in water with a layer of paraffin on the surface; the cylinder is removed by being drawn out of the water in a vertical position, so that a perfect paraffin film adheres to its inner surface.

In contact with an unbroken film the blood remains unclotted for ten to fifteen minutes.

(NOTE.—The difficulties of this method would seem to have been overcome by the direct syringe method described in a previous number of this journal.)

(c) Transfusion of citrated blood :—

Rendle Short has described a neat and efficient method. The apparatus consist of a bottle holding 20 to 30 ounces, partially praffined inside by inserting a small piece of wax, m.p. 42 degrees C., before autoclaving. Into this is run 160 c.c. of isotonic sodium citrate solution. Citrated blood keeps safely for half an hour or more.

(d) Preserved red cells :—

Red cells can be kept without change in a citrate dextrose solution for several weeks. The life-saving effect was apparently as good as with whole-blood methods.

RISKS.

(1) Incompatibility of blood—a 30 per cent. risk of hæmolytic, and a 5 to 10 per cent. risk of alarming or fatal reaction.

(2) Conveyance of syphilis. This can be avoided by doing a Wassermann test.

(3) Transmission of malaria.

COMPATIBILITY OF BLOOD.

As regards their compatibility, blood falls into four groups. Consanguinity is no safeguard. As it has been established that a blood which will hæmolyse another will also agglutinate it, use is made of agglutination tests.

The groups may be classified as follows :—

Group I.—5 per cent.	Suitable for patient of
Group II.—40 per cent.	Group I.
Group III.—10 per cent.	Group I, II.
Group IV.—45 per cent.	Group I, III.
	Group I, II, III, IV.

What matters is the effect of the receiver's plasma on the donor's cells and not the reverse owing to the great bulk of the receiver's blood compared with the amount transfused. Donors should, therefore, belong to the same group as the recipient or else to group IV.

Stock group II and group III sera may be kept, and by microscopic drop methods agglutination observed. To the donor's cells are added the known sera, and the results prove in the following ways :—

Donor's cells agglutinated by serum II and serum III, then donor is group I.

Donor's cells agglutinated by serum III, not by serum II, then donor is group II.

Donor's cells agglutinated by serum II, not by serum III, then donor is group III.

Donor's cells are not agglutinated by either, then donor is group IV.

If stock sera are not obtainable, the following procedure may be adopted. A few c.c. of blood is drawn from the patient, the clear serum separated and a little citrate solution added. With a drop of this on a glass slide mix in a very little of the donor's blood. If there is

agglutination in five minutes the donor is unsuitable.

ENLARGEMENT OF THE ABDOMEN IN CHILDREN.

Guy's Hospital Gazette, August 9th, 1919.—
CAMERON.

DR. CAMERON refers to the prominence of the abdomen in normal children during the first year of life, and points out that tuberculous peritonitis is a disease of great rarity during the first month.

Bearing these facts in mind enlargement of the abdomen in children not due to tubercular peritonitis may be caused by,—

(1) Lack of muscular tone :

This may be roughly estimated by a glance at the abdomen when the child is standing.

(2) Rickets.

(3) Muscular dystrophies.

(4) Other forms of peritonitis, of which pneumococcal is the commonest.

This form may be distinguished by the high polymorphonuclear leucocytosis which is absent in tubercular peritonitis.

(5) Hirschsprung's disease :

This may be distinguished by the immense gaseous distention of the abdomen, the obstinate constipation which yields at times with the passage of enormous masses of faecal matter and a corresponding decline in the abdominal enlargement. The presence of visible peristalsis and X-ray examination after a bismuth enema should make the diagnosis clear.

(6) Mucous disease :—

Children suffering from this disease are pale and wasted with a furred tongue and foul breath. The abdomen is prominent and there is frequent complaint of pain. The temperature is apt to be irregularly raised. Constipation and diarrhoea alternate.

The characteristic feature is the large quantities of mucus which the stools contain from time to time.

The diet, as a rule, has contained an excessive amount of carbohydrate or starchy foods. The children are always excitable, nervous and fretful.

(7) Coeliac disease :—

This is another cause of enlargement of the abdomen and symptoms similar to tuberculous peritonitis. The most important symptom is the inability to absorb fat and a tendency to pass pale, greasy, foul-smelling stools. The fat, though split, is passed as fatty acid and soap. The stools, though pale, still contain bile.

TREATMENT OF DIABETES.

AN OUTLINE OF THE ALLEN METHOD.

EXPERIENCE has shown that Dr. Allen's treatment in diabetes, which was published three years ago, constitutes a distinct advance on previous methods in that in suitable cases it brings about a rapid disappearance of glycosuria and affords an opportunity of keeping the urine free from sugar for long periods on an adequate diet.

ESSENTIALS OF THE METHOD.

Essentially the procedure is as follows :—The patient is allowed *water, tea, coffee, and meat extracts only*, with possibly a *small quantity of cream*, say $\frac{1}{2}$ oz. per diem, and occasionally whisky or brandy at night, until his urine has been free from sugar for twenty-four hours. Food is then given, beginning on the first day with green vegetables, say 4 oz., and butter $\frac{1}{2}$ oz., and two eggs. The next day the allowance of vegetables is increased and a small quantity of meat may be tried, say 3 oz. On the third or fourth day, provided the urine is still free from sugar, the addition of starchy foods is begun, so that usually five or six grm. of starch are added every other day, protein, or protein and fat, being added on the intervening day until the allowance of these is sufficient. A simple way to add the carbohydrate is to allow 1 oz. potato on the fourth and fifth days, 2 oz. potato on the sixth and seventh, and omit the potato, substituting 1 oz. bread, on the eighth and ninth days, and so on. When sugar returns, it is usually sufficient to omit the starchy foods completely for one day and return rapidly to an allowance of starch distinctly less than that at which sugar returned. This allowance may then be very slowly increased.

As the diet increases more variety can be introduced. Besides regulating the carbohydrate, the total energy value of the diet has to be considered. Allen found that in experimental diabetes the animals had less glycosuria and survived longer when they were underfed, than when they were fed freely without carbohydrate, and the same applies to man. A good rule is to insist on the weight being kept distinctly below normal. An allowance of 2,000 calories a day with, say, 70 grm. carbohydrate is found to be sufficient for a moderately active life, though if hard work is undertaken more will be necessary. Even during the fast it is not necessary to keep the patient in bed, and for the remainder of the treatment a certain amount of exercise is desirable, as the tolerance both for food in general and for carbohydrate is increased thereby.

Frequently the patient is instructed how to test his own urine for sugar and is provided with a list from which he can vary his diet without altering his intake. The vegetables and the caloric value of the diet need not be rigidly regulated provided they conform generally to prescriptions but for starchy foods and fruits strict limitation is necessary, according to the tolerance established.

CONTROL INFORMATION.

The information required is as follows :—

Vegetables with 5 per cent. carbohydrates or less, 7 calories per ounce, greens, cauliflower, marrow, onions, green beans, rhubarb, tomatoes, celery, etc.

Vegetables and Fruit, 10 per cent. carbohydrate or less, 10 calories per ounce, turnips, swedes, carrots, beetroot, oranges, strawberries, unripe fruits.

Carbohydrate 15 per cent., 15 calories per ounce, parsnips, artichokes, apples, bananas, many fruits; plums and grapes have 20 per cent.

Important foods, carbohydrate per cent., calories per ounce, oatmeal 60 per cent., 110; flour 75 per cent., 100; bread 50 per cent., 75; milk 5 per cent., 20; cream 4 per cent., 70; butter nil, 225; cheese 2 per cent., 100; meat nil, 80; fish (cod) nil, 15; eggs nil, 70 calories each; nuts 5 per cent., 75.

Cases who respond to treatment can avoid glycosuria with reasonable care for indefinite periods, though it would be an exaggeration to describe them as cured; and sudden reappearances of the sugar occasionally occur, which are met by a temporary diminution of the carbohydrate allowance. Obviously, for success it is important to deal with a case in the early stages of the disease; but in this connection it is well to note that among slight glycosurias there is a condition called *diabetes innocens*, in which the sugar in the blood is not above normal and the urinary sugar is small in amount and does not tend to increase. These cases, in which Allen's treatment is neither necessary nor desirable, can be distinguished by determination of the sugar in the blood, and by observation of the urine.

The most satisfactory cases for treatment are young adults, and it is just these who would be expected to be rapidly progressive without treatment. In senior diabetics the response is less marked; but where the treatment is practicable it has a distinct beneficial influence on diabetic gangrene and on sepsis.

FAILURES EXPLAINED.

The treatment thus outlined may fail in two ways :—
(1) Glycosuria may disappear with fasting, but reappear persistently before an adequate diet is reached. In some of these it may be possible to avoid glycosuria by the use of a diet containing little or no carbohydrate beyond that of the vegetables of the first group, giving an occasional fast of one day when sugar returns. If this is not practicable the case can be classed with the second group. (2) Glycosuria diminishes but does not disappear with starvation, which for practical purposes should be limited to three or at most four days. In these cases the diet may be regulated and a periodical fast prescribed, say once a week; but it is debatable whether any real benefit is obtained by the repeated fast, except with reference to acidosis, as the patient is liable to get very weak and is perhaps more prone to infection.

SEVERE CASES.

In the most severe cases, whose urine shows a well-marked reaction for diacetic acid, the influence of fasting is beneficial in that the diacetic acid diminishes both during the fast and in the period of feeding immediately following the fast, but a similar result is also obtained by limiting the diet to vegetables, oatmeal, and a little milk, thus combining the influence of partial starvation with that of a considerable intake of carbohydrate, both of which are known to diminish excessive acidosis. The latter procedure is probably preferable in the worst cases.

The influence of fasting on the acidosis of diabetics is the opposite of that in normal individuals, in whom fasting causes diacetic acid to appear in the urine in small quantity. Where there is no previous acidosis, the diabetic behaves in this respect in the same way as the normal; just as with the normal, the intensity of the diacetic acid reaction obtained varies greatly with different individuals, and there appear to be some who starve badly in this respect, giving an excessively marked reaction in the urine by the second day with possibly other symptoms of acidosis. In such a case, it is necessary to give carbohydrate food at once. Previous preparation with a diet poor in fat is said to be useful, but instances of this complication are rare and can easily be dealt with when they occur if the urine is regularly tested during the fast.—*The Hospital*.

MODERN TREATMENT OF BURNS.

THE use of paraffin preparations represents but a part of the advance in the treatment of burns, and forms a technical rather than therapeutic development. For application of such covering to the damaged tissues no antiseptic action is claimed, but the degree by which pain is relieved is remarkable, and in itself gives the method considerable right to general adoption. Apart from forming a protective film-like covering replacing the epidermis, the paraffin apparently acts as a purifying factor by tending to collect in its substance much of the oily contaminating dirt to which many such wounds have been exposed. In parallel with modern tendencies in all wound treatment, the method aims to shield and encourage the natural processes of tissue repair without artificial attack upon bacterial infection. The principle is by no means new, but the simplicity of such dressings, the ease with which the materials can be carried and the patient's comfort constitute a great improvement upon any previous methods.

There are by now a number of preparations on the market, but perhaps the best known is Ambrine, originally introduced by Dr. Barthe de Sandfort in 1915-1916, and understood to consist essentially of paraffin with the addition of oleum succini. These materials melt at about 120-124 degrees F., and may be applied with a brush, as suggested in the directions supplied by

the makers, but preferably, as experienced in service hospitals, by means of a simple metal spray. The Naval Medical Service uses an efficient form, in which ambrine may be melted up either in a water-bath or over a spirit-flame, and the apparatus used repeatedly, as the contained material may be liquefied many times without losing its essential properties. The whole provides a most convenient means of application in either hospital or mobile units.

As in all such simple methods, there are several equally simple essentials to success. The wounds must be thoroughly cleansed in sterile water, the addition of even dilute antiseptics being considered unnecessary. Burnt surfaces must be dried as thoroughly as possible by touching, not rubbing, with sterile wads of cotton wool, and with great care to avoid the production of oozing or exudation. In hospital a current of hot air is most useful for this purpose. Later, no bleeding from granulations is to be allowed—and in the spray itself care should be taken to have a dry container and allow no beads of water to enter the paraffin from the surrounding bath.

If this ideal technique be employed a perfect film is formed, and is both sterile, from the temperature at which it is employed, and airtight. Solidification is very rapid. Above the initial layer is placed a very thin sheet of absorbed cotton, also fixed in place by free application of the spray, and the whole is then covered with the usual cotton wool and bandage. A strong perfect layer of paraffin must always intervene between the fabric and the wound surface, otherwise sticking and ruin of the whole method will occur. Normally, however, the dressing may be removed easily by cutting with scissors through the whole cast, warmth, as an air current or hot sterile swab, aiding the process at any point where faulty application has caused slight adherence.

It is found that in extensive burns the dressing must be at first renewed every twenty-four hours, owing to the amount of exudation, but later the interval may often be doubled. Free serous exudation, or even a mild unpleasantness of odour, is not a contra-indication to paraffin, for in numbers of such cases granulation and the good growth of epithelium may be seen throughout. With obviously septic states it is, of course, another matter, but the paraffin method may be ultimately employed in a great number of these after the usual stage of surgical cleansing has been passed.

Advocates of such treatment claim that not only is healing accelerated, but that both scarring and ultimate contraction are markedly reduced. This fact in itself would constitute an invaluable advance, for, wonderful though recent plastic surgery has proved itself to be, the tremendous deformity often caused by burns under former conditions of healing would have set the surgeon a truly difficult task. Actually it would seem, after three years have elapsed and every opportunity to observe the wonderful results obtained in thousands of burns cases, that equal credit is due to such initial healing technique and to modern surgery, in not only reducing deformity and disfigurement, but, far more important, in the restoration of functional perfection.—*The Hospital*.

THE DIETETICS OF DIABETES AND GLYCOSURIA.

The Practitioner, August 1919.—W. LANGDON BROWN, M.A., M.D., F.R.C.P.

"A REGULATED diet is the sheet anchor of treatment in diabetes."

Rollo first discovered that the limitation of the carbohydrate intake benefited the symptoms of diabetes. As a result all carbohydrates were prohibited and proteins and fats allowed *ad libitum*. It was then realised that serious symptoms, and even coma, might be produced by the sudden cutting off of carbohydrates.

The significance of acetonuria due to incomplete oxidation of fats was next recognised, and it was shown that diacetic acid is poisonous even in the form of a neutral diacetate.

Attempts to find some form of carbohydrate which the diabetic could assimilate—such as were embodied in the so-called oatmeal cure and potato cure—were only partially successful. Lævulose can be tolerated in small amounts, but is too expensive.

Von Noorden, recognising the influence of protein in exciting glycosuria, introduced the egg and vegetable diet. He maintained that cooked eggs and vegetable proteins, particularly gliadine, were tolerated best of all.

Fasting as treatment for diabetes was introduced by Guelpa but he wrongly considered the results to be due to diminution in intestinal intoxication.

Allen in America and Graham in England, independently formulated a systematic method based on the three principles, fasting, egg and vegetable diet, and restriction of protein intake.

The general principles underlying both methods are as follows:—After a preliminary fast the diet is increased step by step, and when a certain level (estimated in calories) has been reached the carbohydrate intake is increased until sugar appears in the urine.

The amount of carbohydrate ingested is then kept well below this, and days of complete or partial alimentary rest are intercalated as required.

While it is true that sudden restriction of the carbohydrate intake will cause acetonuria, both glycosuria and acetonuria are reduced if the intake of proteins and fats is also cut down. The normal fasting individual develops acetonuria because he has to live on his own fat; but this is not sufficient to counter-balance the drop caused by curtailing the ingested fat.

The procedure recommended by the writer is to try Graham's method (as detailed below) repeating it from start to finish three times or until the glycosuria disappears. When the urine has been free from sugar for a few days, the diet is cautiously relaxed by the successive additions first of 5 oz. of milk and then of half an ounce of bread every other day until the sugar just returns. A day of egg and vegetable diet is then interpolated and if the glycosuria disappears return to the former diet with only 75 per cent. of the carbohydrate previously tolerated.

Carbohydrate values:—

1 oz. of bread	..	16 grms.
2 oz. of potato	..	16 grms.
2 oz. of green peas	..	10 grms.
3 oz. of artichoke	..	12 grms.
3 oz. of baked apple	..	15 grms.
5 oz. of milk	..	6 grms.

Two consecutive egg and vegetable days should be given once a fortnight, preceded by two days of the * mitigated fast once a month.

* Mitigated by an allowance of tea, coffee, clear soup and lemonade.

"Non-Diabetic" Glycosuria.—This term includes :—

(1) Renal glycosuria in which, irrespective of diet, 1 to 2 per cent. of sugar passes into the urine. The blood sugar is sub-normal. In this case the patient should not be put on a diabetic diet; but, if free intake of carbohydrate increases the glycosuria, the patient should be advised to avoid excess.

(2) The alcoholic group in which albuminuria and glycosuria co-exist. Cutting down the consumption of alcohol is all that is needed here.

(3) Glycosuria due to over-action of the thyroid or pituitary body. Attention should be directed to the glandular disease with moderate restriction of the carbohydrates.

(4) Glycosuria due to organic disease of the pancreas. Here the power of digesting all food-stuffs is impaired and we must rely on such proteins as can be rapidly digested by the stomach, such as lightly cooked minced meat, or such as can be dealt with by the succus entericus of the small intestine—caseinogen preparations and gelatine.

(5) The glycosuria of pregnancy—probably due to its stimulating effect on the thyroid and pituitary. This form is usually amenable to moderate restrictions.

GRAHAM'S METHOD.

(Slightly modified.)

Two hunger days. Tea and coffee as desired, and 500 c.c. of bovril and broth, made without vegetables, divided into two equal portions. Water or lemonade, sweetened with saccharine, can be taken. *ad lib.*

Followed by two vegetable and egg days.

Breakfast.—Two scrambled eggs, with tea or coffee, 2 oz. (50 grms.) of lettuce, watercress, or tomato.

Lunch.—8 oz. bovril or broth. 1 poached egg on spinach. Any green vegetables with $1\frac{1}{2}$ oz. of butter. The total amount of the vegetables for the meal to be 6 to 8 oz.

Tea.—Tea or coffee, lettuce, watercress, or tomato, 50 grms. or 2 oz.

Dinner.—8 oz. bovril or broth. 2 eggs, cooked as desired, *e.g.*, as savoury omelette. 6 to 8 oz. green vegetables with $1\frac{1}{2}$ oz. of butter. Water or lemonade as desired.

This diet has a calorie value of 1,170 and a carbohydrate intake of about 10 grms.

Ladder diet.—After two vegetable and egg days add 50 grms. of meat or 100 grms. of fish. This raises the calorie value to about 1,300. Two days later, add 50 grms. of bacon at breakfast and omit one egg. Add another 10 grms. of butter to the vegetables. The calorie value is now 1,595. Two days later, add 50 grms. of sardines at lunch, and omit one egg, or if the fish has previously been given, omit this and add 100 grms. of meat. The calorie value is now 1,635. Two days later, add 50 grms. of ham and omit another egg. The calorie value is now 1,795. The quantities of sardines and ham may

be doubled if the patient is hungry, and the degree of acetonuria is slight. This brings the calorie value up to 2,145.

This diet is generally known as the "Ladder Diet," and it will be noticed that it takes 12 days to reach the top of the ladder. If the patient is free from sugar when at the top of the ladder, add either 100 c.c. of milk (4 grms. carbohydrate) or 10 grms. of bread (equals 6 grms. of carbohydrate in war bread, 5 grms. in ordinary bread). Increase by the same quantity every other day until the limit of carbohydrate tolerance is reached. If the patient is not sugar-free when at the top of the ladder, repeat the whole process.

In general terms : I give two consecutive vegetable and egg days once a fortnight and two hunger days, followed by two vegetable and egg days, once a month, returning to the standard diet, as determined for the particular patient, immediately after these days. But the details of the after-treatment must depend on the individual case. Rest in bed is advisable, at any rate till the calorie value of the food reaches 2,000.

BLACKWATER FEVER.

The Journal of Tropical Medicine and Hygiene,
August 1st, 1919.—J. P. WILLIAMS.

IN this paper the writer describes the treatment of ten cases of blackwater fever with eight recoveries and two deaths.

The previous history of these cases showed :—

(1) That they had never taken quinine as a prophylactic although each had resided several months in an endemic area.

(2) That each of them had, for some three to six months preceding the onset of blackwater fever, suffered from repeated attacks of malaria, which they had either "treated" themselves, or neglected to carry out the instructions of their medical attendant.

The treatment employed was as follows :—

(a) *Careful nursing.*—

In addition to keeping a four-hour temperature chart, a chart of the total volume of all fluids administered to, or excreted by, the patient, was also kept.

(b) *Drugs.*—

On admission, 20 centigrammes of galyl intravenously and an intramuscular injection of 9 grms. of quinine bi-hydrochloride. The galyl injection was repeated on the third day, and the quinine injection every twelve hours until the graver symptoms subsided when it was replaced by the oral administration of 5 grms. three times a day.

Persistent vomiting and hiccough were treated by Sternberg's mixture (150 grms. sodium bicarbonate, 1/3 grn. mercury perchloride in a quart of water; $1\frac{1}{2}$ oz. every hour).

(c) *Vigorous hydrotherapy.*—

A hot pack, applied for three hours, was given on admission. 4 oz. warm saline was given by the rectum every four hours. In grave cases

$\frac{1}{2}$ oz. of brandy was added to each saline. Glucose may also be added. The oral administration of hot fluids was encouraged. The patient sometimes drank a pint an hour.

(d) *Precautions against heart failure.*—

These consisted in keeping the patients in bed for at least seven days after the disappearance of the hæmoglobinuria.

CONCLUSIONS.

1. That the previous history in each case tends to show that the blackwater fever of West Africa is a manifestation of recurrent and inefficiently treated malaria, and that this is further supported by the fact that immediate and repeated intramuscular injections of quinine, combined with galy, injected intravenously, and vigorous hydro-therapy, is a satisfactory treatment.

2. That the prophylaxis of blackwater fever is essentially that of malaria.

3. That in galy we have a very important remedy, since it apparently has (a) a stabilising effect upon the hæmoglobin and, therefore, an anti-hæmolytic; (b) an anti-parasitic action; and (c) an accelerating effect on the formation of red blood corpuscles.

In one grave case in which it was successfully used, the hæmoglobin (Tallqvist) was only 20 per cent. of the normal.

Further, in no case of blackwater fever in which I have used it have any ill effects attributable to galy appeared.

4. That no person who has suffered from blackwater fever should return to an endemic area until after at least four months spent in a temperate climate.

BACTERIAL PROTEIN INJECTIONS IN INFLUENZAL PNEUMONIA.

The Journal of the American Medical Association,
March 29, 1919: ROBERTS AND CARY.

THE vaccine or bacterial protein used by the authors was a saline suspension containing in each c.c. 100 million influenza bacilli; 100 million pneumococci types I, II and III; 100 million streptococci and 100 million staphylococci. One c.c. was given as an initial dose and the dose increased according to the amount of reaction.

Reaction.—A chill accompanied by a definite rise in the pulse rates set in after half an hour. One to two hours later there was a rise of temperature of 1 to 3 degrees, usually of short duration. No untoward results were noted even in severe cases.

Relative mortality.—In series I with expectant treatment the mortality was 31.2 per cent. In series II treated with protein injections the mortality was only 9.5 per cent.

Recovery by crisis.—In series I crisis occurred in 20 per cent. In series II the temperature dropped by crisis in 36 per cent.

From the results it would seem that protein injections have a very definite therapeutic value.

As regards the status of non-specific protein therapy, the authors quote the work of various investigators. Gay and Claypole have noticed a rise in the leucocytic count. Others have called attention to a rise in agglutinin and lysin production in animals subjected to high temperatures. Others again have shown that the opsonin and lysin content of human and animal serum is definitely raised after the therapeutic injection of foreign protein. Herrmann concludes that "the intravenous injection of foreign protein serves as a stimulus for the liberation of specific anti-bodies in animals in which the previously injected antigen was unable to cause such a liberation."

Bacterial vaccines have the further advantage of there being no danger of anaphylactic sensitization.

FOOD.

ANTISCORBUTICS.

IN the presence of readily procurable vegetables and fruit in temperate climates, scurvy rarely forces itself upon attention. But, in the tropics, the advent of the hot season with its accompanying diminished vegetable supply demands watchfulness of authorities in charge of embodied men, and of institutions such as jails and asylums, not only as to the quantity of vegetables and fruit available but as to the position of *each* substance in the scale of antiscorbutic power. Having regard to the many advances made during the present generation in both medical and sanitary science, the lack of precise information on the latter point permits to the practical sanitarian, in giving advice, mere generalizations where specific choice of articles available should be forthcoming. Indeed, there exists a large field of sanitary and economic interest in the tropics on this subject, which merits expert investigation.

Lemons or Limes?—Fortunately, the Lister Institute at the hands of Drs. Chick, Hume and Skelton, has recently made, as a result of experimental enquiry, considerable advances in the required direction by getting rid of faith of long standing in the prophylactic and curative influence of lime juice.* They show that "the value of fresh lemon juice is four times that of fresh lime juice." Mrs. Alice Henderson Smith, in a historical enquiry, gives evidence which explains that the original material on which professional faith was founded was in reality lemon juice obtained from the south of Europe, and this when used in Arctic expeditions did excellent service as an antiscorbutic. In latter years, however, lime juice was obtained from the West Indies and has been consistently the material officially recognised, with results in similar expeditions of a disastrous nature.

Germinated legumes.—The suggestion, derived from experiments, made by Drs. Chick and Hume,† that, in the absence of fresh vegetables, germinated legumes should prove of value, has already received excellent demonstration in practice by Dr. H. W. Wiltshire, n.s.o. In treatment of Serbian soldiers suffering from scurvy,‡ he was able to arrive at "the definite conclusion that dry beans develop upon germination an amount of antiscorbutic vitamine at least equal to if

* *Lancet*. 1918. Nov. 30. pp. 735-738.

† *Jl. Roy. Army Med. Corps*. 1917. Aug. Vol. 29; p. 121.

‡ *Lancet*. 1918. Dec. 14. p. 811.

not greater than contained in fresh lemon juice." In regard to the dietary of these soldiers before admission for treatment, he concludes that the precipitating of the scorbutic state was more due to the undue employment of heat in cooking the vegetable substances, and thus destroying the antiscorbutic vitamine, than the actual lack in quantity of the necessary constituents; and (putting aside the destructive influence of caustic soda which is not employed in army kitchens) he, consequently, lays down, as a standard ruling, that it should be endeavoured "to reduce the heating of all vegetables to the absolute minimum required to make them digestible." He claims that the use of germinated legumes is not only cheap but possible in the midst of campaign exigencies—even where air temperature is such as to demand some aid from artificial heat. Following the spirit of the method laid down by Chick and Hume, he obtained a germination as follows:—

"Haricot beans were prepared according to the directions given in an appendix to the article quoted above. They were first soaked in clean water for 24 hours and then placed in tin trays for 48 hours to germinate. Old ration biscuit tins, cut in half longitudinally and freely perforated with holes, were found serviceable for this purpose; they were easily to make, clean, and handy and each half held 7 lb. of beans—a day's dose for 28 patients. Since germination takes about 48 hours at a temperature of 60 degrees F., it can easily be carried out in this country in May, when the mean temperature is 67 degrees. The whole process is very simple, the only essentials being that the seeds must be kept moist, but not shut off from free circulation of air. After germination ten minutes' boiling was ample to fit the beans for eating."

"If facilities are lacking for keeping a supply in process of germination, the time taken must be shortened by the provision of artificial warmth."

"The space required and needing to be kept warm is very small. Allowing 2 oz. per man per day, a dose which should be ample for prophylaxis, a day's supply for 1,000 men could easily be accommodated in a space of 30 cubic feet. On an average of three days for soaking and germination this means that a space of 100 cubic feet would suffice to provide a continuous supply for 1,000 men."

Capt. H. W. Dyke, R.A.M.C., in the *Lancet* of Oct. 19th, 1918, p. 513, deals with the causes and prevention of an outbreak of scurvy in the South African Native Labour Corps, of which he had charge in France. He attributed the outbreak to a combination of two influences: (1) "Inability in the case of certain companies to supplement the diet occasionally with extra fresh fruit; and (2) reduction of the antiscorbutic value of the fresh vegetables supplied by extra cooking. The marked improvement occurring directly in those companies in which measures were taken to supplement diet and enforce a reasonable period of cooking justifies this opinion."

Fresh malt beer.—In connection with this outbreak of scurvy in the presence of an allowance of 1 lb. (frozen) meat, or 8 oz. preserved meat, with 8 oz. fresh vegetables daily, Captain Dyke remarks that in the course of eight years' practice in Basutoland, he had never encountered a case of scurvy in a native; notwithstanding the fact that during the summer he has "an abundant supply of fresh vegetables, roots and fruits but, in his kraal, from April to November (the winter and spring months) the average native obtains no vegetables or fruit." He is of opinion that an explanation of this circumstance is afforded "by the discovery of Fuerst, verified and amplified by Chick and Hume, that during the germination of seeds the antiscorbutic substance is developed in large amount, for Kaffir beer, of which natives partake largely, up to three gallons a day, is a thin fermented gruel made of germinated millet."

[*Tamarind* (?).—Throughout the Madras Deccan, the rural population, during the hot season, fails to make provision for vegetable growing under wells or other form of irrigation, and, indeed, at all seasons, the total addition of vegetables to the staple grains of

the diet is irregular and small. Whilst a few may add butter milk or curds to the diet, the normal addition (beyond condiments and "ghee"—clarified butter—or oil) would be tamarind, as the one acid and flavouring material. The writer has always credited this with good antiscorbutic powers, and considers an experimental investigation of its rôle in the diet of the rural Indian should be of value. It may be here remarked that whilst 8 oz. of fresh vegetables *per diem* did not apparently suffice to prevent scurvy in the South African Native Labour Corps, in Indian Jails where tamarind is issued as part of the diet, 6 oz. of fresh vegetables only is prescribed without obvious ill effect. If tamarind possesses antiscorbutic properties of any value, the readiness with which its transport in masses can be effected, if the pulp be made free of non-edible matter, should be of advantage.]

Kiln dried malt beer.—A search of Admiralty records (by Mrs. Alice Henderson Smith of the Lister Institute) reveals a former belief in the efficacy of beer as an antiscorbutic of at least an adjuvant value, so that the reader is apt to indulge in visions of an early general demand by "those who go down to the sea in ships" for beer, as an acceptable substitute for the now discredited lime juice, but, as in the case of the lime *versus* lemon juice enquiry above referred to, it was ascertained that the "beer" (sweetwort and similar preparations) issued in the Navy up to about 1792 was the product of recently germinated grain, whereas more modern beer is derived from malt which has been "high dried and kilned," with consequent detrimental action on the antiscorbutic vitamine.

Raw vegetable juices.—Dr. H. Chick and Miss Mabel Rhodes of the Lister Institute have further added to knowledge of antiscorbutic substances, by attempting to ascertain some cheaper vegetable juice for infant feeding where indicated with pasteurized milk, and possessed of more trustworthy antiscorbutic properties than the generally advised grape juice.* Their experiments were conducted on guinea pigs, whose susceptibility to scurvy is well recognised, with somewhat startling results. The swede turnip, so far as the human being is concerned, occupies a very low rank in nutritive value, but these experiments at once exalt it to a place of importance as an antiscorbutic substance which, in reference to infant welfare, is both cheap and readily procurable. They summarize the results obtained as follows:—

"Among fresh fruit juices that of the orange is easily the most suitable, and possesses a value about ten times as great as that of fresh grapes. Of the raw vegetable juices examined, raw swede juice proved to be far the most potent, approximating in value to raw orange juice; the raw juice of carrots was found to be much inferior, and that of beetroots failed to prevent scurvy in the largest dose (20 c.c. daily) that could be administered to the experimental animals."

—*Tropical Diseases Bureau.*

FIXED DIETS.

In this *Bulletin* (Sanitation Number), Vol. 6, No. 5, Sept. 15, 1915, various jail diets are discussed with special reference to the recommendations of Major McCay, I.M.S. In the case of the Bengal Jails, where rice has been hitherto the staple grain, the Inspector General of Prisons, Lt.-Col. Buchanan, C.I.E., I.M.S., thought it desirable in introducing the change to *festina lente*, and therefore made the part substitution of wheat for rice (desirable for securing additional proteids) a matter of individual choice by convicts. The result has been a steady increase of adoption of the wheat substitution, as the convicts have secured practical experience of its advantage. Lt.-Col. Buchanan, in his Administration Report of the Jails of the Bengal Presidency for 1917 (p. 17), shows by means of the

* *Lancet*, 1918. Dec. 7. p. 774.

following table that the convicts who elected to add wheat to their diet have acted wisely :—

	Gained weight per cent.	Lost weight per cent.	Bowel complaints per cent.
Bengal diet*	50	23.5	17.8
Wheat	55	21.9	12.1

* Rice diet at both meals.

—Tropical Diseases Bureau.

BLACKWATER FEVER.

DATA concerning 39 cases of black water fever are afforded in the Section dealing with the Southern Province in the (1916) Annual Medical and Sanitary Report for Nigeria. The cases included 19 Government officials and 20 non-officials who had suffered during the years 1915 and 1916. The chief points brought to light are as follows :—

"Six patients had previously suffered from black-water fever, and two of these had had two previous attacks. The interval between the last and the present was 3 months, 7 months, one year, 2 years; two attacks in the previous three years—six years, and seven years.

"There was a definite history of antecedent attacks of malaria within the preceding six months in every case with the exception of one, where it was stated there had been no malaria.

"Regarding the prophylactic use of quinine it was stated to be 'regular' in four cases, 'five grains daily' in five cases. It was 'every other day,' 'twice a week' frankly 'irregular' or 'only when feeling unwell' in the remainder.

"The particular salt used in prophylaxis was mentioned in 18 cases. The bisulphate was used in 9, the hydrochloride in 5, the sulphate in 2, and the bi-hydrochloride and euquinine in one each."—Tropical Diseases Bureau.

THE MODE OF SPREAD OF CANCER : ITS TREATMENT BY RADIATION.

Proceedings of the Royal Society of Medicine.

—W. SAMPSON HANDLEY, M.S.

Mode of spread of carcinomata and sarcomata.—The writer's remarks refer chiefly to the spread of breast cancer.

He draws attention to the spread of tumour cells by permeation of the lymphatic vessels. Permeation is defined as "the continuous tendril-like growth of lines of cancer cells, by their own proliferative power along the smaller lymphatic vessels." Infiltration on the other hand is the growth of cancer cells through the intercellular spaces.

The facts of lymphatic anatomy are important in this connection. Just superficial to the deep fascia, there is a plexus of vessels of microscopic size forming an investment for the body as complete as the skin itself. This fascial plexus is fed by vertical tributaries from the skin above and from the muscles below. Although it is drained by certain lymphatic trunks conveying lymph to the cervical, axillary, and inguinal glands, there is no discontinuity and no barrier anywhere to the spread of cancer.

Emboic invasion of the regional lymphatic glands is of secondary importance and cancer cells which reach the blood usually disappear without giving rise to metastases. Permeation takes place almost as readily against the lymph-stream as with it.

The microscopic growing edge of a neoplasm is to be sharply distinguished from the infiltrating edge, where the cancer cells have invaded the intercellular spaces. At the peripheral microscopic growing edge there is no interstitial invasion of the tissues, but the fascial lymphatic plexus is found to be obstructed by the growth of lines of cancer cells within the vessels. Between this annular growing edge and the primary neoplasm permeated lymphatics are found to be absent owing to destruction by perilymphatic fibrosis.

"Cancer thus spreads in the parietal tissues by permeating the lymphatic system like an invisible annular ringworm."

TREATMENT OF BREAST CANCER BY RADIATION WITHOUT OPERATION.

The radiographer should know the exact site of origin of the primary growth in the breast and map out on a chart the outline of the presumed circle of infected tissues.

It is not sufficient to radiate the primary growth alone. The advancing edge of the tumour may be on the circumference of a circle 10 to 12 inches diameter in moderately advanced cases. It is here that the cells are most active and at the same time most vulnerable. The use of diaphragms to stop down the tube should be to a large extent dispensed with and as large an area as possible radiated.

PROPHYLACTIC RADIATION.

It has been the writer's practice to submit every case to a prophylactic course of X-rays after operation. In view of the possibility that a portion of the microscopic growing edge may have escaped extirpation, the area submitted to radiation should be a circle, 12 inches to 14 inches in diameter, centred upon primary focus.

Dangerous areas such as the inner extremity of the second, third, or fourth intercostal spaces, or the supraclavicular triangle of the same side, should receive special attention.

In advanced cases radiation of the axilla is also advisable.

NATURAL CURE OF CANCER.

In a lecture on this subject the author came to the conclusion that : "Every aggregation of cancer cells after increasing in size for a varying period and at a varying rate, tends spontaneously to undergo certain degenerative or regressive changes. These changes begin at the centre of the mass, spread centrifugally to its circumference and may terminate in the replacement of the mass of cancer cells by a fibrous scar."

These changes are exemplified by the ulceration of a primary growth and in the umbilication of secondary deposits in the liver. It is thus possible that in every carcinoma we have to deal with a comparatively small number of perfectly healthy and active cancer cells and with a large number of more or less degenerate or dying cells. The former kind are to be found in the lymphatics at the microscopic growing edge.

In a discussion on the above paper Dr. Finzi suggested irradiation before operation to prevent implantation at the time of operation. The suggestion is based on the fact that a mouse carcinoma which has been given a sufficient dose of radiation cannot be implanted. The best time to give such a dose would be a fortnight before the operation.

SIR WALTER BUCHANAN FUND.

Lt.-Col. G. Hutcheson, I.M.S., Allahabad ..	Rs. 200
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Reviews.

CATECHISM SERIES.—Medicine: Parts IV and V, 2nd Edition; Physiology Part II, 3rd Edition; Physics: Part II, 2nd Edition. Published by Messrs. E. and S. Livingstone, Edinburgh. Price 1s. 6d. net each part.

THE editions under review retain all the good features of the catechism series in general and have been thoroughly revised up to date.

It is unnecessary to dilate on the value of this series of publications. It may, however, be stated that, while by no means professing to be a complete exposition of the subject, very few points of importance are missed, and no better exercise for the student can be imagined than careful perusal of the contents of these excellent compendiums. The arrangement into question and answer is particularly useful to those about to sit for examination.

A MANUAL OF GYNÆCOLOGY.—By JOHN COOKE HIRST, M.D., Associate in Gynæcology, University of Pennsylvania; Obstetrician and Gynæcologist to the Philadelphia General Hospital. 12 mo. 466 pages with 174 illustrations. Philadelphia and London; W. B. Saunders Company, 1918. Cloth 12s. net.

FOR a book of its size it contains a mine of information. The author aims at compressing into a small space all the essential facts of gynæcology. The arrangement is that followed in teaching. Unprofitable discussion is omitted, the object being to give the student or practitioner at least one method of treatment, the value of which has been proved by experience.

There is a special chapter on leucorrhœa, one of the commonest disorders for which a patient consults her physician, which is frequently neglected in books on gynæcology because it is a symptom and not a primary condition.

A feature of the book is the number of excellent illustrations designed to make clear those points which puzzle the average student.

It is a book which can be confidently recommended to the student and practitioner as embodying the best in current practice and containing all the essential fundamental facts of gynæcology.

OBITUARY.

ARTHUR NEVE, F.R.C.S., Edin.

WITH the passing of Arthur Neve, the Medical Mission Cause in India has sustained a severe loss. His life was an inspiration to his colleagues. With great singleness of aim he devoted himself to the work of the Kashmir Mission Hospital, and he was privileged to see that institution extending a very widespread and deep influence in Kashmir, not only by the high quality of the medical and surgical relief afforded to hundreds of thousands, but also by its continuous witness to the high ideals of the Christian Faith. How deep that influence has been, was revealed by the very profound mourning and the universal testimony from all classes of the population, of their recognition of the nobility of a life spent thus in disinterested service.

Arthur Neve was Head of the Mission Hospital for thirty-seven years. He succeeded the late Dr. Edmund Downes. In 1900 the Gold Kaiser-i-Hind Medal was conferred upon him by the late Queen Victoria. In 1911 the Royal Geographical Society awarded to him the 'Back' grant for meritorious original work. Dr. Neve was a frequent contributor to medical journals. He was author of the well known 'Guide to Kashmir,' of 'Picturesque Kashmir,' and of 'Thirty years in Kashmir.'

At the call of the great war, he went Home and obtained a commission as Major, R.A.M.C., working at first at the Brighton Hospitals for Indian wounded and subsequently being transferred to the Dartford Military Hospital, where he was appointed surgical expert. His work received recognition in despatches. Towards the end of the war he crossed to France and did strenuous work in a casualty clearing station and was present at the British entry into Lille.

The funeral, which was military, was most impressive. Imperial Service Troops, His Highness the Maharajah's Band and the Indian Defence Force preceded the wreath-covered bier, while behind followed an immense throng of all classes of the population, British, Kashmiri, Indian, Moslem priests, Hindu officials, rich and poor, all gathered together to render their last tribute of respect to one who was greatly beloved by the people.

ANNUAL REPORTS.

ANNUAL REPORT OF THE SANITARY COMMISSIONER WITH THE GOVERNMENT OF INDIA FOR 1917.

THE Sanitary Commissioner's Annual Report for 1917, though somewhat belated, is an exceedingly fine production. The coloured graphs and columns illustrate the contents in a most interesting manner. The report runs to nearly 150 pages of printed matter and another 140 pages

of tables—the whole subject being dealt with in great detail.

We draw attention to the remarks on the great problems of the future, and on the efforts already made to combat some of the chief diseases.

BIRTHS AND DEATHS.

In the following table is set forth the total number of births and deaths registered in each administration of British India in the year under report :—

The urban death-rate for British India as a whole was 36.62, which is 4.41 in excess of the rural rate. As usual, it was only in Bengal, Bihar and Orissa and Assam that the rural mortality rates were in excess of the urban rates.

CHIEF CAUSES OF MORTALITY.

In the table on page 436 are detailed the number of deaths ascribed to the six causes of mortality under which deaths are at present recorded in British India.

PROVINCE.	BIRTHS.			TOTAL DEATHS.			RATIO OF DEATHS PER 1,000 OF POPULATION.			MEAN DEATH RATE DURING PREVIOUS FIVE YEARS.		
	Total number.	Ratio per 1,000 of population.	Mean ratio during previous five years.	In municipalities and towns.	In districts excluding towns.	Total.	In municipalities and towns.	In districts excluding towns.	Total.	In municipalities and towns.	In districts excluding towns.	Total.
Delhi ...	21,982	52.75	...	8,346	5,274	13,620	36.42	28.13	32.68	...	...	...
Bengal ...	1,627,873	35.91	33.32	61,820	1,125,680	1,187,509	21.26	26.53	26.19	23.98	30.61	30.19
Bihar and Orissa ...	1,395,157	40.4	40.8	40,740	1,173,811	1,214,551	34.2	35.2	35.2	29.1	30.7	30.7
Assam ...	189,741	31.35	32.46	2,622	161,303	163,923	21.95	27.19	27.09	24.06	27.43	27.36
United Provinces of Agra and Oudh ...	2,157,642	46.03	44.91	143,042	1,631,854	1,774,396	46.37	37.27	37.91	38.35	31.04	31.55
Punjab ...	876,733	45.3	45.2	75,302	657,807	733,109	42.77	37.43	37.91	34.59	30.82	31.16
North-West Frontier Province ...	65,549	32.1	34.3	6,245	54,917	61,162	32.65	29.69	29.95	28.05	25.24	25.5
Central Provinces and Berar ...	669,842	48.13	48.14	53,309	448,525	501,834	41.71	35.48	36.06	41.54	36.59	37.03
Madras Presidency ...	1,295,078	32.4	32.1	152,474	897,071	1,049,545	31.4	25.5	26.2	27.5	22.3	22.9
Coorg ...	5,338	30.51	26.50	329	4,722	5,051	32.96	28.62	28.87	48.91	31.87	32.84
Bombay Presidency ...	699,823	35.73	36.09	142,132	656,274	798,406	44.70	40.00	40.76	35.55	29.06	30.09
Burma { Lower ...	217,172	35.53	32.69	27,219	124,161	151,380	34.98	23.32	24.80	34.28	21.42	23.93
Upper ...	138,964	37.34	35.62	13,394	83,827	97,221	41.34	24.67	26.13	42.27	27.11	28.42
Ajmer-Merwara ...	18,455	36.81	41.87	Not available.	...	51,623	Not available.	...	102.96	Not available.	...	45.13
British India ...	9,379,349	39.33	38.58	726,983	7,025,226	7,803,832	36.62	32.21	32.72	32.30	29.24	29.49

The total number of births recorded in British India was 9,379,349, equivalent to a birth-rate of 39.33 as compared with 38.58, the mean rate of the previous quinquennium. The highest birth-rates were returned by Delhi, 52.75; Central Provinces and Berar, 48.13; United Provinces, 46.03; Punjab, 45.3; and Bihar and Orissa, 40.4. The lowest rates were returned by Coorg, 30.51; Assam, 31.35; North-West Frontier Province, 32.1; and Madras, 32.4. The birth-rates recorded by six administrations out of the thirteen were in defect of the mean quinquennial rates.

The 7,803,832 deaths recorded in British India in 1917 are equivalent to a death-rate of 32.72; this rate is 3.23 in excess of the mean rate of the previous five-year period. The birth-rate exceeded the death-rate by 6.61, a low figure for India. Five of the major administrations reported death-rates in excess of the mean British India rate. Bombay headed the list with 40.76, which is 10.67 in excess of the mean rate for the previous quinquennium. The United Provinces and the Punjab were bracketed second, each reporting a mortality rate of 37.91 as compared with 31.55 and 31.16, respectively, the mean quinquennial rates. The Central Provinces and Berar and Bihar and Orissa occupied fourth and fifth places on the list with death-rates of 36.06 and 35.2 respectively. The small province of Ajmer-Merwara reported the appallingly high death-rate of 102.96: this excessive mortality was in a very large measure due to plague, which was unprecedentedly prevalent throughout Rajputana in the year under report. The lowest death-rates were recorded in Lower Burma, 24.80; Upper Burma, 26.13; Bengal, 26.19; Madras, 26.2; and Assam, 27.09. Incidentally it may be noted that these provinces embrace practically the whole of plague-free India.

The possibility of amplifying our death returns in the direction of introducing new heads, and so reducing the number of deaths returned under 'all other causes,' and sub-dividing those heterogeneous groups 'fevers' and 'respiratory diseases,' is at present under consideration. Anyone at all conversant with conditions prevailing in rural India need not be reminded that progress must be slow, and that there is but little hope of immediate decided improvement. There is no organised health staff for more than 90 per cent. of India's population; only an insignificant percentage of the people who die annually are seen at any stage of their final illness by persons possessing any sort of medical qualification; the actual recording of vital statistics nearly everywhere in rural India is in the hands of a staff who may have some claim to literacy but certainly no other qualifications. Attention has been repeatedly directed to these matters in previous reports; unless the fallacies be kept carefully in mind one is tempted to draw more deductions from the vital statistics of India than the figures warrant. Special inquiries and investigations, carried out from time to time, have contributed information regarding the health conditions prevailing in certain parts of the country, as have our dispensary returns, but our knowledge of the causes of the morbidity and mortality of India is still woefully deficient. The total number of births and deaths reported is in most places an approximation of the truth; but as to the cause of death much is left to surmise. Something can be deduced from a study of the sex and age distribution of mortality, and a good deal may be inferred from the seasonal prevalence of deaths. The chief epidemic scourges of India have each a reasonably well defined seasonal prevalence, a knowledge of which allows one to draw tentative

conclusions. Plague, malaria, cholera and relapsing fever are examples of such diseases which in epidemic form extort their greatest toll at certain seasons of the year.

It is now more generally recognised that improvement in our methods of collecting vital statistics must precede or accompany any real progress in health matters, and that a more or less accurate knowledge of the prevalence of preventable disease is the first essential to any organised measures of prevention. The development of a rural health organization, commensurate with the importance of the issues involved, is the only way of effecting this pressing reform. The health problems of India are of enormous difficulty—perhaps no other part of the civilised world presents health problems of similar magnitude; but a marked improvement in the present state of affairs is possible, provided the money can be found. Modern health measures are expensive, but if they be founded on sound lines they are also surprisingly remunerative. One thing is certain, the rate of economic, industrial and social progress of India will be determined in no small measure by our success in dealing with the parasitic infections of India's population, which at present are so serious a handicap to efficiency.

1.21 in the previous year. Bihar and Orissa suffered more heavily from this disease than any other administration, and was responsible for 41 per cent. of the all-India cholera mortality, reporting a cholera death-rate of 3.1; Assam, 1.81, and Madras, 1.5, were the only other administrations in which the cholera death-rate was in excess of unity. The North-West Frontier Province was altogether free from the disease, and the incidence was extremely low in Upper Burma, the Central Provinces, Delhi and the Punjab.

SMALLPOX.—Smallpox was not an important cause of mortality in the year under report. The 62,277 deaths ascribed to it are equivalent to a mortality rate of 0.26, as compared with 0.25 in 1916. More than half the smallpox deaths were reported from the Madras Presidency, where the disease caused a death-rate of 0.9. The two small provinces of Coorg and Ajmer-Merwara suffered, relatively, very severely, returning smallpox death-rates of 3.23 and 2.54.

PLAGUE.—During the year under report 437,036 deaths were attributed to plague, equivalent to a death-rate of 1.83, as compared with 0.86 in the previous year. The exceptional severity of the outbreak of 1917-18 was the subject of a special note to Government, which will be found on pages 64 *et seq.* of this report. In

PROVINCE,	CHOLERA.		SMALLPOX.		PLAGUE.		FEVERS.		DYSENTERY AND DIARRHŒA.		RESPIRATORY DISEASES.		ALL OTHER CAUSES.	
	Total deaths.	Ratio per 1,000.	Total deaths.	Ratio per 1,000.	Total deaths.	Ratio per 1,000.	Total deaths.	Ratio per 1,000.	Total deaths.	Ratio per 1,000.	Total deaths.	Ratio per 1,000.	Total deaths.	Ratio per 1,000.
Delhi ...	12	·02	88	·21	4	·009	6,567	15·76	450	1·03	4,981	11·95	1,538	3·69
Bengal ...	45,021	·99	7,010	·15	163	·003	882,768	19·47	25,000	·55	11,510	·25	216,077	4·76
Bihar and Orissa ...	109,620	3·1	6,643	·1	45,436	1·3	776,231	22·5	30,210	·8	7,926	·2	238,485	6·8
Assam ...	10,953	1·81	4,116	·68	...	...	95,518	15·78	12,057	1·99	5,387	·89	35,894	5·93
United Provinces of Agra and Oudh ...	21,440	·46	2,011	·04	129,084	2·76	1,266,519	27·05	22,308	·46	28,926	·62	304,608	6·50
Punjab ...	1,365	·07	1,417	·07	8,775	·45	510,812	26·42	15,571	·80	54,392	2·81	140,777	7·28
North-West Frontier Province ...	...	...	87	·04	8	·004	50,561	24·77	507	·25	1,939	·94	8,060	5·94
Central Provinces and Berar ...	691	·05	452	·03	48,036	3·45	226,204	16·26	35,438	2·55	49,027	3·52	141,986	10·20
Madras Presidency ...	58,939	1·5	34,958	·9	24,708	·6	321,902	8·0	73,394	1·8	51,840	1·3	483,804	12·1
Coorg ...	32	·18	566	3·23	9	·05	3,614	20·65	76	·43	35	·20	719	4·11
Bombay Presidency ...	17,003	·87	3,095	·16	162,874	8·31	298,919	15·26	36,321	1·85	90,667	4·63	189,527	9·68
Burma { Lower ...	1,886	·31	544	·09	4,645	·76	52,037	8·53	6,583	1·08	6,149	1·01	79,536	13·04
{ Upper ...	28	·01	15	·00	1,879	·50	29,269	7·87	1,902	·51	3,084	·83	61,044	0·41
Ajmer-Merwara ...	12	·02	1,275	2·54	11,415	22·77	34,300	68·41	1,187	2·37	958	1·91	2,476	4·94
British India { 1917 ...	267,002	1·12	62,277	·26	437,036	1·83	4,555,221	19·10	260,984	1·09	316,821	1·38	1,904,491	7·99
{ 1916 ...	288,047	1·21	60,642	·25	205,527	·86	4,085,784	17·13	248,381	1·04	286,247	1·20	1,765,805	7·40

It must not be inferred from the above that no progress has been made in the past; the sanitation of towns, water supplies and drainage schemes have received, and are receiving, an increasing amount of attention; special plague and cholera staffs, travelling dispensaries, occasional malaria campaigns, special tuberculosis campaigns in certain towns, and measures taken to reduce infantile mortality rates have done, and are doing, a great deal of most valuable work. The most consistent efforts made towards ameliorating the health conditions of India are directed towards vaccination, though smallpox nowadays is responsible for less than one per cent. of India's total mortality. The success obtained in the matter of vaccination, carried out, as it is by a poorly paid agency, should be sufficient to convince those who are sceptical of the possibility of improving at the present time the health conditions of the Indian village. If India's other health problems can be dealt with as consistently as smallpox has been, real progress will not long be delayed.

CHOLERA.—To cholera was ascribed 267,002 deaths, which represent a death-rate of 1.12, as compared with

that note the plague experiences of India during the last twenty years have been epitomized and but few further remarks are called for in this place. Attention is directed to the plague map of India, reproduced at the beginning of this volume, which illustrates the incidence of plague mortality in each district of India from the beginning of the present pandemic up to date. A somewhat similar map accompanied the annual report of the Sanitary Commissioner with the Government of India for the year 1912. A comparison of the two maps illustrates such extensions of the plague-infected areas of India as have occurred during the intervening 5½ years. The incidence of plague mortality in Native States is also indicated in this map although this report confines itself to a consideration of the health conditions prevailing in British India proper.

FEVERS.—"Fevers" were the cause of 4½ million deaths or more than 58 per cent. of the total mortality from all causes. The "fever" death-rate for India as a whole was 19.10, as compared with 17.13 in 1916 and 16.73 in 1915. The proportion of total deaths ascribed to "fever" was comparatively low in Madras, 31 per

cent.; Burma, 32 per cent.; and Bombay, 37 per cent.; Ajmer-Merwara returned the extremely high fever death-rate of 68.41; it is probable that a considerable proportion of these deaths should have been attributed to plague.

Year after year in this report emphasis is laid on the impossibility of attempting anything like a detailed analysis of the deaths ascribed to fevers. Something will be said about the matter when the various administrations are receiving separate consideration. In most provinces the seasonal fluctuations in the number of fever deaths indicate that malaria plays an important part in the production of the total mortality. The unprecedented rainfall in the year under report, to which reference has already been made, was directly responsible for an extreme prevalence of malaria in certain parts of the country, notably in parts of the Punjab, Sind and Rajputana. In Bengal there appears to have been less malaria than usual.

DYSENTERY AND DIARRHŒA.—A death-rate of 1.09 was ascribed to dysentery and diarrhœa, as compared with 1.04 in 1916. Of the major provinces, Central Provinces and Berar, 2.55; United Provinces, 1.99; Bombay, 1.85; and Lower Burma, 1.08, alone reported dysentery and diarrhœa death-rates in excess of unity.

REPORT ON THE STATISTICAL RETURNS OF THE PROVINCIAL LUNATIC ASYLUM IN ASSAM, 1918.

MAJOR J. W. MCCOY, I.M.S., held charge of the Provincial Lunatic Asylum at Tezpur throughout the year 1918.

Third-grade Sub-Assistant Surgeon Muktar Hussain was the Deputy Superintendent.

GENERAL.

The total number of lunatics confined in the Asylum at the close of the year 1918 was 357, including one observation case, of whom 282 were males and 75 females. During the year under review, 110 (96 males and 14 females) were admitted into the Asylum, including 5 re-admissions, the corresponding admission figure for 1917 being 116.

There were 5 re-admissions, of whom 4 were males and 1 female, against 12 and 3, respectively, in the previous year. The intervals since discharged were one month to 7 years.

The number of discharges, excluding 6 escapes and 2 observation cases found sane, was 46 against 70 in the previous year. Of these, 37 were discharged cured and 9 were made over to their friends as "mentally improved."

There were 26 escapes during the year under report, against 23 in 1917, of whom 6 remained uncaptured at the end of the year. All cases of escapes were duly reported to the Magistrate and the police. The responsible keepers were adequately punished.

The daily average strength rose from 341.44 to 376.71. The year opened with 121 criminal lunatics and 28 were admitted during the year; of these 5 were discharged, one escaped, who is still at large, and 6 died, leaving 137 in the Asylum on the 31st December, 1918. The daily average strength was 129.85, against 130.60 in 1917.

Classified by religion, 64 were Hindus, 24 Muhammadans, and 16 other castes, i.e., a total of 104. These figures exclude 4 observation cases carried to the next year and 2 cases discharged as sane. Of these, 75 were natives of the province, 21 came from other provinces, while the residences of the remaining 8 were unknown. In the province itself the Sylhet, Kamrup and Sibsagar districts were responsible for the largest number of patients, viz., 24, 8 and 8 respectively. The admissions comprised 92 males and 12 females.

Cultivators and tea-garden coolies furnished the largest number of admissions. As in previous years, the admissions were mostly during the age period 20 to 40 years.

The male inmates are mainly employed on cultivation of vegetables and sugarcane, repair of buildings and palisading, tailoring and manufacture of molasses

(gur). The females are employed on paddy-husking and sundry petty works within the female enclosure.

During the year under review, a temporary ward with a pucca floor, for 26 inmates, was completed. The total accommodation now available is for 315 males and 97 females, or a total of 412.

The maximum number confined on any one night was 320 males and 77 females, or a total of 397. The overcrowding is relieved by converting a godown into a barrack when needed.

Night-soil is trenched on a selected site in the Asylum grounds outside the stockade, regularly and properly, but infectious stools are destroyed in an incinerator.

The Asylum was visited twice by the Inspector-General of Civil Hospitals, Assam, and once by the Commissioner of the Assam Valley Districts. Eleven meetings were held by the visitors during the year.

REPORT ON INFLUENZA ON THE EAST INDIAN RAILWAY, 1918.

BY DR. H. S. WATERS,
Chief Medical Officer.

When the influenza first reached us, in July, the natural line of treatment for the most prominent symptom, general pains, was salicylates.

Before August was out, common sense showed us that this was wrong, the severe nervous heart depression was increased by these drugs, and the cases except those which were very mild did badly.

The most dangerous of the sequelæ, pneumonia, is a further serious heart depressant, and those cases treated with salicylates mostly died.

A circular was sent out to all our medical staff pointing this out and suggesting as the line of treatment—

Nux Vomica, Ammon. Carb., Liq. Ammon. Acet., with such additions as might be found necessary, while the pains were treated by opium. As soon as this treatment was working generally we had much better results.

As an illustration—

At Manauri Oil Factory we have a population of 1,000 menials.

Amongst these we had 422 cases with 7 deaths, a case mortality of 1.6 per cent.

In the village alongside the mortality was reported as 50 per cent., and in the case of three neighbouring villages, the whole population with the exception of one girl, was wiped out.

As an illustration of the eccentricity with which the disease spread—

(1) At the Oak Grove East Indian Railway Schools, the Boys' school was attacked first, the Girls next and the Junior last.

The Boys' school and the Junior are situated on one Hill and the Girls' on an adjacent one with a valley between, the total extent of the estate 245 acres.

All three schools are separate but juniors do meet the boys during play hours.

The population is as under :—

Boys' School	..	..	220	
Girls' School	..	..	118	
Junior School	..	..	105	Boys.
Staff	..	..	72	Girls.
Babooos	..	..	56	
Menials	..	..	9	
	..	..	225	Includes families.

To attend on them we had one Medical Officer, two Sub-Assistant Surgeons and 8 Nurses, so that the treatment was probably much better than what was obtainable by the average case. Everyone of the nurses in turn contracted the disease. These are included in the list of staff sick.

A curious fact was the way the infection spread through the schools.

On 8th October, 1918, the Boys' school was attacked.

On 17th October, 1918, we had amongst the boys 140 cases and at that time the Girls' school had started with 5 cases. It was not until 26th October, 1918, that the first case occurred in Junior school.

The total number of cases we had at the Oak Grove Schools was 283.

One hundred and ninety-five were treated in the schools hospital and the others in their quarters or dormitories. We had only 4 cases of pneumonia and one died, a mortality of 0.35 per cent. amongst the Europeans and East Indians.

Amongst the menials we had 30 cases with a mortality of 3.3 per cent.

(2) At the Colvin Free Schools, Allahabad,
100 Boys.
60 Girls.

The boarding establishments are separate, with a distance of almost a mile between them. The school classes are mixed, boys and girls, sitting together daily.

Amongst the menials we had 30 cases with a mortality of 3.3 per cent.

The composite charts, (A) for uncomplicated influenza, and (B) of influenza pneumonia, of which A is made up from 187 cases and B from 12 cases treated in the East Indian Railway hospitals at Allahabad and Oak Grove, and tabulated returns to show the monthly incidence on each sub-district, are published in the report.

While reading this, please note that contractors' men such as work in the Jamalpur Loco. Shops, Lillooah Carriage and Wagon Shops and Engineering Staff, particularly the gangmen, simply absent themselves when sick, and these figures do not include absentees, nor is it possible to work out anything in the shape of per cent. of sick to strength for an outbreak such as this.

On the whole line we treated 28,859 cases with 509 deaths. Mortality of cases 1.7 per cent.

THERAPEUTIC NOTES.

THE WELLCOME LABORATORIES.

THE Wellcome Chemical Research Laboratories were founded by Mr. Henry S. Wellcome in 1896, and form part of the Wellcome Bureau of Scientific Research directed by Dr. Andrew Balfour, C.B., C.M.G.

The Laboratories are devoted mainly to the investigation of materials likely to be of value in medicine, and since 1896 nearly 200 papers, dealing with such subjects, have been communicated to scientific societies in this country and abroad. These investigations fall mainly into two groups :—

(1) The chemical examination of plants already used in medicine, or which have enjoyed in this or other countries some reputation as domestic remedies.

(2) The investigation of alkaloids and other active constituents of drugs with a view to the determination of their constitution and the possible synthesis of such active principles or of substances likely to possess similar therapeutical value.

Service Note

HONOURS.

MENTIONED FOR WAR SERVICE.

MRS. THORNBY, wife of Major M. H. Thornby, I.M.S.

CAPT. J. A. D'SOUZA, I.M.S.

LT.-COL. W. S. WILLMORE, I.M.S.

MILITARY CROSS.

T.-CAPT. ALEXANDER JOHN D'SOUZA, I.M.S.

INDIAN MEDICAL SERVICE.

NEW RATES OF PAY.

THE India Office notifies as follows :—

The new rates of pay, of which particulars follow, have been arrived at by adding approximately 33 1/3 per cent. to that portion of the old rates of pay which represented military grade pay. The old rates are shown in the second column for comparison. The new rates are effective from December 1, 1918, and the necessary adjustments will be carried out as soon as possible.

A. Military Side.

These rates were previously announced in May, but at that time the rates for the civil side were not available.

They are now republished with the civil rates in order that full information for the whole service may be available.

	(1) New Rate.	(2) Old Rate
	Rs. p.m.	Rs. p.m.
Lieutenants ...	550	(450) ¹
Captains ...	700	(550)
Captains (after 5 years' total service)	750	(600)
Captains (after 7 years' total service)	800	(650)
Captains (after 10 years' total service)	900	(700)
Majors ...	1,000	(800)
Majors (after 3 years' service as such)	1,150	(900)
Lieut.-Colonels	1,550	(1,250)
Lieut.-Colonels (of over 25 years' service) ...	1,600	(1,300)
Lieut.-Colonels (selected for increased pay) ...	1,750	(1,400)

The new rates are consolidated and include charge pay for the command of station hospitals.

The following rates are those for certain of the higher military appointments :—

	(1) New Rate.	(2) Old Rate.
	Rs. p.m.	Rs. p.m.
D.D.M.S. (if held by a Major-General)	2,650	(2,200)
D.D.M.S. and A.D.M.S. (if held by a Colonel) ...	2,150	(1,800)
A.D.M.S. of Aden: Inspector of Medical Services, Army Headquarters ...	1,950	(1,600)
A.D.M.S. in the Field (when held by an officer below Colonel's rank)	1,950	(1,600)
Officer Commanding General hospital in the Field of 500 beds ...	1,700	(1,400)
A.D.M.S., Army Headquarters ...	1,700	(1,400)

¹ In the case of a lieutenant the rate for an officer in officiating charge only has been shown, as this is the most probable position of a lieutenant.

B. Civil Side.

1. The rates for certain of the superior appointments are as follows :—

	(1) New Rate.	(2) Old Rate.
	Rs. p.m.	Rs. p.m.
Director-General	3,500	3,000
Deputy Director-General	2,150	1,500
Assistant Director-General	1,700	1,400
Surgeons-General, Bengal, Madras and Bombay	3,000	2,500
Inspectors-General of Civil Hospitals in non-Presidency Provinces*	2,600	2,250
Sanitary Commissioner to the Government of India	2,300-2,800	2,200-2,500
Sanitary Commissioner (for all provinces except Central Provinces and Assam)	1,800-2,100	1,250-1,800
Sanitary Commissioners, Central Provinces and Assam...	1,550-2,050	1,250-1,800
Inspectors-General of Prisons, Madras, Bengal, Burma, Bombay, and United Provinces ...	2,100-2,300	1,500-2,000
Inspectors-General of Prisons, Punjab, and Bihar and Orissa	2,100	1,500-2,000
Inspector General of Prisons, Central Provinces	1,800	1,500-2,000

2. The distinction between first and second class civil surgeoncies is abolished, and holders of these appointments will, in future, be paid at the new consolidated rates, given under A above, according to their military rank. This change results in increases varying according to rank from Rs. 200-400 per mensem.

3. Holders of professorial and bacteriological appointments will, like civil surgeons, be paid at the new consolidated rates, given under A above, plus a special allowance of Rs. 250 per mensem. The resultant increase over the old rates varies from Rs. 150 per mensem in the case of junior captains to Rs. 400 per mensem in the case of senior lieutenant-colonels.

4. Holders of other special classes of appointments will receive the consolidated pay of rank, as under A



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I take Virol myself when I am run down, as I find it very beneficial. It was also prescribed for me at the Devonshire Hospital, Buxton, where they always have it "on Tap."

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above, plus special allowances of differing amounts—for example, alienists and plague officers Rs. 200 per mensem, superintendents of first class gaols Rs. 150 per mensem, personal assistants to surgeons-general Rs. 100 per mensem, superintendents of second class gaols Rs. 50 per mensem.

The examples above are not exhaustive, but are given as illustrations of the manner in which the principle previously announced has been carried into effect.

MAJOR-GENERAL W. E. JENNINGS, M.D., I.M.S., is granted privilege leave of absence for ninety days.

MAJOR H. HALLIDAY, B.M., I.M.S., is appointed to be Civil Surgeon, Simla West, with effect from the 20th August, 1919.

In exercise of the powers conferred by clause (a), subsection (1) of section 4 of the United Provinces Medical Act, III of 1917, the Local Government is pleased to nominate Lieut.-Col. W. H. E. Woodwright, F.R.C.S.I., I.M.S., officiating Inspector-General of Civil Hospitals, United Provinces, to be President of the United Provinces Medical Council, vice the Hon. Col C. Mactaggart, C.S.I., C.I.E., I.M.S., resigned.

LIEUT.-COL. A. W. T. BUIST, I.M.S., made over charge of the duties of Superintendent of the District Jail at Rawalpindi to Rai Sahib Lala Gopal Das, Officiating Civil Surgeon, Rawalpindi, on the afternoon of the 27th August, 1919.

LIEUT.-COL. D. W. SUTHERLAND, C.I.E., I.M.S., Principal, King Edward Medical College, Lahore, was on deputation as Consulting Physician, North-West Frontier Force, Peshawar, in addition to his own duties from the 26th May to 10th June, 1919 (both days inclusive), and again from the afternoon of the 31st July, 1919, until further orders.

LIEUT.-COL. J. STEPHENSON, D.Sc., C.I.E., I.M.S., Principal, Government College, Lahore, has been granted one year's furlough preparatory to retirement, with effect from the 1st September, 1919, under Article 308 (s) of the Civil Service Regulations.

RETIRED.—Major D. S. A. O'Keefe, M.B. 26th July, 1919.

THE King has approved the retirement of the following officers:—

Major W. L. Trafford, in consequence of ill-health. 18th October, 1918.

Capt. M. J. Roche, in consequence of ill-health. 31st January, 1919.

Lieut.-Col Sir James Reid Roberts, Kt., C.I.E., M.B., F.R.C.S., Bengal, is permitted, subject to His Majesty's approval, to retire from the service, with effect from the 9th July, 1919.

MAJOR WALTER LIDWELL HARNETT, M.B., F.R.C.S., is granted, subject to His Majesty's approval, the acting rank of Lieut.-Col. while commanding No. 48 Indian General Hospital. Dated 4th January, 1919.

LIEUT.-COL. CHARLES HARDWICK L. MEYER, M.D., Indian Medical Service (retired), whose re-employment was notified in Army Department Notification No. 997, dated the 1st September, 1916, has been permitted to resign, with effect from the 31st March, 1919.

CAPT. JOSEPH HENRY SMITH, M.B., Indian Medical Service, to be Deputy Medical Store-Keeper to Government, as a temporary measure, with effect from the 9th August, 1919.

CAPT. EDWARD SLADE GOSS, M.C., Indian Medical Service, to be Deputy Medical Store-Keeper to Government, as a temporary measure, with effect from the 14th August, 1919, vice Captain G. Tate, Indian Medical Service, reverted to military duty.

The services of Major A. W. Overbeck-Wright, M.D., I.M.S., are placed permanently at the disposal of the Government of the United Provinces.

LIEUT.-COL. J. C. H. LEICESTER, M.D., F.R.C.S., I.M.S., is appointed to officiate as Professor of Midwifery, Medical College, and Obstetric Physician and Surgeon of the Medical College Hospitals, Calcutta, with effect from the afternoon of the 5th September, 1919, and until further orders.

INDIAN MEDICAL SERVICE.

SUBJECT to His Majesty's approval, the undermentioned to be temporary Lieutenants, with effect from the dates specified:—

Perry Praine Tobit. Dated 11th July, 1919.

Mohan Lal Kalra, M.B. Dated 12th July, 1919.

Bhupes Chandra Dasgupta, M.B. Dated 28th July, 1919.

Lal Madhab Banerjee, M.B. Dated 1st August, 1919.

Mysore Puttanna Sambamurti Rau. Dated 4th August, 1919.

Sarat Chandra Chakravarti, M.B.; Dharendra Nath Chakravarti, M.B.; Beni Madhava Roy, M.B. Dated 14th August, 1919.

Anantabandhu Roy Chowdhury, M.B. Dated 17th August, 1919.

Madhav Krishna Kelavkar, M.B.; Ardhachandra Banerjee, M.B. Dated 18th August, 1919.

Bhagat Ram Tandon, M.B. Dated 23rd August, 1919.

His Excellency the Governor in Council is pleased to appoint Major A. Chalmers, M.B., F.R.C.S.I., I.M.S., to act as Civil Surgeon, Hyderabad (Sind), with attached duties, during the absence of Major J. B. Christian, I.M.S., on leave or pending further orders.

INDIAN MEDICAL SERVICE.

Temp. Lieutenant to be temp. Captain.

KARI SORABJI BHIVANDIWALLA. 15th March, 1919.

NOTE.—The notification in the London Gazette, dated 1st July, 1919, regarding the promotion of Lieut. A. N. Tyte, to the temp. rank of Captain, is cancelled.

LIEUT.-COL. W. D. H. STEVENSON, C.I.E., M.D., I.M.S., Assistant Director-General, Indian Medical Service (Sanitary), is granted privilege leave for three months, with effect from the 3rd September, 1919, or such subsequent date from which he may avail himself of it.

MAJOR J. A. CEDECKSHANK, M.C., I.M.S., of the Bacteriological Department, is appointed to officiate as Assistant Director-General, Indian Medical Service (Sanitary), during the absence on privilege leave of Lieut.-Col. W. D. H. Stevenson, I.M.S., or until further orders.

MAJOR H. HALLIDAY, M.B., I.M.S., is appointed to be Civil Surgeon, Simla West, with effect from the 20th August, 1919.

CAPT. MOSES SOLOMON, Indian Medical Service, is permitted, subject to His Majesty's approval, to resign his temporary commission on account of ill-health, with effect from the 20th August, 1919.

To be acting Lieutenant-Colonels.

Officers Commanding, Combined Field Ambulances.

CAPT. H. L. GABSON, M.C., Royal Army Medical Corps. Dated 7th May, 1919.

CAPT. P. B. BHARUCHA, D.S.O., Indian Medical Service. Dated 19th May, 1919.

Major A. Cameron, Indian Medical Service. Dated 23rd May, 1919.

Major J. D. RICHMOND, D.S.O., Royal Army Medical Corps. Dated 1st July, 1919.

CAPT. J. B. HANAFIN, Indian Medical Service. Dated 17th July, 1919.

Officer Commanding, Indian General Hospital.

MAJOR L. M. MACRAE, Indian Medical Service. Dated 22nd June, 1919.

Officer Commanding, Indian Field Ambulance.

CAPT. J. P. HUEOM, Indian Medical Service. Dated 17th July, 1919.

*To be acting Majors.**Deputy Assistant Director of Medical Services.*

CAPT. W. M. WILL, Indian Medical Service. Dated 21st May, 1919.

Registrar, Indian General Hospital.

CAPT. C. G. HOWLETT, Indian Medical Service. Dated 26th June, 1919.

SUBJECT to His Majesty's approval, Captain Cedric Cowan Macredy has been permitted by the Right Hon. the Secretary of State for India, to retire from the service on account of ill-health, with effect from the 21st June, 1919.

WITH reference to Army Department Notification No. 2721, dated the 29th August, 1919, the undermentioned officers are promoted to the rank of Colonel, with effect from the dates shown against their names:—

Lieut.-Col. Fairlie Russell Ozzard, 10th January, 1919, *vice* Col. Henry Francis Cleveland, C.I.E.

Brevet Col. Allan James Macnab, C.B., C.M.G., F.R.C.S., 2nd April, 1919, *vice* Col. Philip James Lumsden, M.B.

Lieut.-Col. (temp. Col.) Charles Neil Campbell Wimberley, C.M.G., M.B., 15th May, 1919, *vice* Col. Thomas Stodart, M.B.

Col. Ozzard's tenure of appointment will reckon from the 15th March, 1919. The dates from which the tenure of appointments of Cols. Macnab and Wimberley will reckon, will be notified later.

THE post of Assay Master was held by Lieut.-Col. J. J. Bourke, I.M.S., from the beginning of the year till 1st August, 1918; by Dr. W. A. K. Christie from 2nd August, 1918, till 6th February, 1919, and by Major H. B. Drake, I.M.S., from 7th February, 1919, till the end of the year.

THE post of Deputy Assay Master was held by Lieut.-Col. J. J. Bourke, I.M.S., in addition to his own duties of Assay Master, from 1st to 11th April, 1918, and by Dr. W. A. K. Christie from 12th April, 1918, to 1st August, 1918, and from 7th February, 1919, till the end of the year.

LIEUT.-COL. D. W. SUTHERLAND, C.I.E., M.D., I.M.S., Principal, King Edward Medical College, Lahore, is appointed Medical Superintendent, Mayo Hospital, Lahore, with effect from 1st April, 1917 (forenoon).

MAJOR H. H. BROOME, F.R.C.S., I.M.S., Professor of Operative Surgery, King Edward Medical College, Lahore, is appointed Medical Superintendent, Mayo Hospital, Lahore, with effect from 4th November, 1918 (forenoon).

Major to be Lieutenant-Colonel.

JOHN WALLACE DICK MEGAW, M.B. Dated the 27th July, 1919.

MEDICAL.*The 23rd August, 1919.*

COL. C. MACTAGGART, C.S.I., C.I.E., M.B., I.M.S., Inspector-General of Civil Hospitals, United Provinces, is granted, with effect from the 15th September, 1919, combined leave for six months and fourteen days, *viz.*, privilege leave for six months under article 260 of the Civil Service Regulations and the Government of India, Finance Department, letter No. 168-C.S.R., dated the 24th February, 1919, and thereafter leave on private affairs under paragraph 226, Army Regulations, India, volume II.

LIEUT.-COL. W. H. E. WOODWRIGHT, F.R.C.S.I., I.M.S., Civil Surgeon, Bareilly, is appointed to officiate as Inspector-General of Civil Hospitals, United Provinces, with effect from the date on which he assumes charge of his duties, until further orders.

Major to be Lieutenant-Colonel.

THOMAS GEORGE NESBITT STOKES, M.B. Dated 27th July, 1919.

NOTE.—In the notification in the London Gazette, dated 17th September, 1918, granting the temporary rank of Lieut.-Col. to Major R. A. Needham, D.S.O., I.M.S., and while holding appointment as Assistant Director-General, Indian Medical Service, add the words "or for the duration of the war."

Notice.

SCIENTIFIC Articles and Notes of interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements, and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscription to "*The Indian Medical Gazette*," Rs. 14, including postage, in India. Rs. 16, including postage, abroad.

BOOKS, REPORTS, &c., RECEIVED:—

The Preparation of Substances Important in Agriculture —a Laboratory Manual of Synthetic Agricultural Chemistry. 3rd Edition. By C. H. Peters, Ph.D. John Wiley and Sons, New York; Chapman and Hall, London, 1919.

Anaphylaxis and Anti-Anaphylaxis and their Experimental Foundations. By Dr. A. Besredka, Prof., Pasteur Institute. English Edition by S. Roodhouse Gloyne, M.D., London. Messrs. W. Heinemann, Ltd., 1919.

Anesthesia and the Nurse's Duties. By A. de Prenderville, M.R.C.S. Messrs. W. Heinemann, Ltd., London, 1919.

Homœopathic Chikitsa.

Catechism Series, Medicine, Physics, Anatomy, Physiology with Fellowship papers. Messrs. E. and S. Livingstone, Edinburgh. 1918-19.

Blindness in India and the Possibilities of its Diminution. By C. G. Henderson, I.C.S., 1919.

National Health: From Magic, Mystery and Medicine to a National Health Service. By T. Rees, M.D., Wigan.

Publications of the Wellcome Clinical Research Laboratories. Nos. 159 to 174, 1919.

Annual Report of the Victoria Memorial Scholarship Fund, 1918.

Annual Report on Sanitation, Dispensaries and Jails in Rajputana for 1918, and Vaccination for 1918-19.

The Practitioner's Manual of Venereal Diseases. By A. C. Waigan, M.D. W. Heinemann, Ltd., London, 1916.

Medical and Sanitary Reports for 1918, Hongkong.

Annual Statistical Returns and Notes on Vaccination, Bihar and Orissa, 1918-19.

Report on Sanitation, Dispensaries and Jails in Rajputana, 1918.

Annual Sanitary Report of the Province of Bihar and Orissa, 1918.

Annual Returns of Hospitals and Dispensaries for Bihar and Orissa, 1918.

Administration Report on the Jails of Bihar and Orissa, 1918.

The Exact Diagnosis of Latent Cancer. By O. C. Gruner, M.D. Messrs. H. K. Lewis and Co., Ltd., 1919.

Mind and its Disorders. By W. B. H. Stoddart, M.D., F.R.C.P. Messrs. H. K. Lewis and Co., Ltd., 1919.

Administration Report of the Municipal Commissioners for the City of Bombay, and Annual Report of the Executive Health Officer, 1918.

Annual Clinical Report, Government Maternity Hospital, Madras, 1918.

LETTERS, COMMUNICATIONS, &c., RECEIVED FROM:—

Keshavlal J. Dholaki, L.M.S., Bhuj (Cutch); Ashutosh Roy, L.M.S., Hazaribagh; Dr. T. Winterbotham, S. India; Miss Eleanor B. Wolf, Guntur, India; the Director, Wellcome Chemical Research Laboratories; Dr. Asana, Kaira, Bombay; D. J. Harries, Capt., R.A.M.C., Kasauli; Dr. Charles E. P. Forsyth, Tezpur, Assam; Capt. K. K. Banerjee, I.M.S., Rawalpindi; Dr. S. K. Aiyer, Trivandrum, Madras; Major T. C. McCombie Young, Sanitary Commissioner, Assam; Lieut.-Col. Sir James R. Roberts, Kt., C.I.E., M.B., M.S., F.R.C.S., I.M.S. (Retd.)

Original Articles.

AN ADDRESS TO THE STUDENTS OF THE MEDICAL COLLEGE, CALCUTTA.

BY SIR KOILAS CHANDRA BOSE, Kt., M.D.

(Delivered at the Distribution of Prizes, 1919.)

It is no little pride and honour to me, who am an old alumnus of this College, to be allowed to take part in the proceedings of this evening, and to say a few words by way of friendly advice to the students, who will, in course of time, be our own colleagues and helpmates. It is not necessary for me to tell you, my young friends, anything about the responsibility attached to the profession you have chosen to follow; nor is it necessary for me to remind the senior students that their medical education will not end with the passing of their final test; on the contrary, it will then make its commencement. Considering the rapid strides with which medicine has been advancing during the present age, you would, I doubt not, agree with me in holding that to achieve success in life one must keep pace with the progress of the times and this one cannot do otherwise than by paying close attention to one's studies and keeping in constant touch with the patients of the hospital.

The teaching of medicine in the early days of this College was, strictly speaking, of an elementary nature, and students were turned out with insufficient knowledge of medicine, surgery, and midwifery. You would be most disagreeably surprised to learn that when the College was opened, the first course of lectures and demonstrations on anatomy were given on clay models, samples of which can even now be seen in the museum. It would, I trust, not be absolutely unpalatable to you, if I were to give you the ancient history of the Medical College and the classes of men who formed the first batch of its students. Gentlemen, you may have heard from your grand and great-grand fathers that before the advent of the British Raj, rational treatment of diseases was denied to the people of this country. When the East India Company took over charge of the Dewani Administration of the Province of Bengal, the rich only could avail themselves of scientific medical treatment from the English doctors who were employed under the Company, and who, when required, lent their services to the people during emergencies, whilst the middle and poorer classes of the people were left entirely to the tender mercies of charlatans, bone-setters, quacks, hakims, and jarars. The English system of treatment was soon appreciated by the people, who longed for it, but could not for want of an institution avail themselves of it. At length, however, at the earnest solicitation of the European townsmen, whose number was small, a charitable dispensary was opened and located at Dharamtala, where the sick,

irrespective of their race, creed and colour, could get gratuitous relief, both morning and evening. It may be mentioned here, that the English, so far back as the year 1792, established a hospital near Chowringhee. The number of attendants grew tremendously great. Besides the magnificent dispensary at Dharamtala, there were two other dispensaries, one at Park Street and the other at Guranhata, with special arrangements for beds for serious cases. It was soon discovered that these institutions were not adequate for the purpose for which they were established. Actuated by the one spontaneous desire to save the Indians from the clutches of imposters, whose number was overwhelmingly large, the European element of the citizens moved Government to extend the operation of the charitable dispensaries, and to abruptly discourage quackery. To satisfy the demands of the sick and to bring rational treatment home to the Indians, a Fever Committee was appointed by Government, and its organization was wholly due to the disinterested labour of Sir Reginald Martin, the Surgeon Superintendent of the Dharamtala Dispensary. From the very commencement of their reign the British took the question of the medical education of Indian youths into their serious consideration, but owing to the apathy of the people, coupled with their superstitious notions, the idea was not consummated, until the year 1835, when Lord William Bentinck opened the Medical College, with every arrangement for a suitable lecture-room, ample accommodation for students, a laboratory, a museum, a dissection-room, and a library. It was built on the north-west side of the Principal's quarters. It is now nearly obliterated by structural improvements of the buildings, and it would be very difficult to give my young friends an idea of it. The premises were subsequently utilized as quarters for the Ceylon students and students of the military classes, and, ultimately, as the chemical laboratory of the present Medical College. It may be mentioned here that within the compound of the College premises there was the Police Hospital, where the sick were admitted. The establishment of the Medical College and the abolition of the rites of *sati* were two prominent events which marked the administration of Lord William Bentinck. They will stand as monuments of his illustrious administration, and will ever be gratefully remembered by the people of this country. The College was opened, but there was considerable amount of difficulty in finding students from the fairly educated class of Indian youths. The facilities offered to the student, though very tempting to the pupils, failed to stir up the twice-born class of people to come to the College: they were averse to entering the anatomy class, and to touching dead bodies. Under the fostering care of the Council of Medical Education these superstitious prejudices were soon removed and the minds of the tender youths expanded and the low class Sudras were replaced by the high class

Brahmans, Kayasthas, and Baidyas. On 10th January, 1836, the late Babu Madhusudan Gupta, whose life-size portrait now adorns the front wall of the Anatomical Theatre, entered the dissecting-room and touched a dead body. This was the day for general rejoicing amongst the Hindu boys, and the whole city was illuminated. Babu Madhusudan was idolized, his example was followed by his fellow-students and the barrier, which at one time was considered insurmountable, was ultimately removed and removed for good. The foundation pupils were recruited from Indian youths, whose ages ranged between 14 and 20, and who were capable of reading and writing English and Bengali, or English and Hindustani. They were required to produce certificates of good character and respectability. The rules for admission of students were made elastic. Subsequently candidates for admission into the Medical College were examined by the Superintendent of this College or by the Education Committee. Their number was restricted to 50. The foundation students received stipends from Government, and the amount ranged between 7 and 12 rupees. The students were allowed to remain in the College for a period of not less than four years, and not more than 6 years. Lectures on the principles and practice of medicine and surgery were given in strict accordance with the mode adopted in Europe. The passed students were admitted into Government service and their pay was fixed at Rs. 30 rising to Rs. 50, and they were allowed to retire on pension after 20 years of service. With the growing desire of the better-class students to join the Medical College, their prospects were made bright, and higher medical training was given them. Five professors were appointed to teach anatomy, chemistry, materia medica, surgery, botany and clinical medicine. There was a museum attached to the College and a curator was appointed in charge of it. Professors were selected from the best men available in the country, and the following gentlemen were appointed to adorn the professorial chairs of the infant Medical College :—

Anatomy :—Dr. H. H. Goodeve, M.D.

Chemistry and Materia Medica :—Dr. W. B. O'Shaughnessy.

Surgery :—C. C. Egerton, Esq.

Botany :—N. Wallich, Esq.

Demonstrator of Anatomy :—Dr. R. O'Shaughnessy.

Curator :—G. Evans, Esq.

Secretary :—D. Hare, Esq.

In 1836 anatomy was regularly introduced. Dr. Goodeve spared no pains to make his teaching successful. The learned professors soon felt the need of a clinical hospital, and in 1838 a small hospital capable of holding 30 beds, with a dispensary for out-patients, was opened. The demands for admission into the hospital were so great that the institution was filled up in no time. The people of Bengal, who were at one time opposed to the English system of medicine,

soon appreciated its value, and within a very short time the demand for admission was so great that Government could not do otherwise than take up the matter for its kind consideration. A scheme for building a commodious hospital on a suitable site, in the centre of the Indian quarter, was chalked out and approved by the Committee. No time was wasted to give immediate effect to this scheme, and on Saturday, the 30th September, 1849, the ceremony of laying the foundation-stone was performed by Lord Dalhousie, the Governor-General, with masonic honours. It was a grand and imposing sight. The time for the ceremony was fixed at 5 P.M., but long before the appointed hour visitors began to arrive. With the exception of the reserved seats the front chairs were occupied by the Calcutta gentry. Amongst those who sat on the dais were Majors-General Sir J. H. Tatler and Dudley Hill, Bishop Wilson, the Hon'ble Mr. Bethune, the Hon'ble Mr. H. N. Elliot, Mr. Halliday, Mr. Buckley and others. A quarter of an hour before the arrival of the Governor-General, the brethren of the masonic craft marched in procession from the Medical College to the place where the ceremony was to take place and drew up in front of the platform. His Lordship, on arrival, was taken to the seat specially reserved for him, the band playing the national anthem. The sight was indeed unique. Those who have witnessed the ceremony of laying the foundation-stone of the Prince of Wales' Hospital may easily form an idea of it. The ceremony was performed strictly in accordance with the rites of the masonic craft.

On the inscription plate it was written :—

"In the reign of Her Most Gracious Majesty Victoria, the foundation-stone of the Medical College Hospital was laid with Masonic Honours by the Right Hon'ble the Earl of Dalhousie, Kt., on Saturday, the 30th September, 1849.

This Hospital is founded for the relief of the sick poor of all classes and creeds in the city of Calcutta and for those afflicted with epidemic diseases."

On the reverse of the plate it was mentioned :

"That the money for the building of the Hospital was raised partly by public subscription through the Municipality and Fever Hospital Committee : through the Council of Education Rs. 1,30,000 was collected and a further sum of Rs. 1,70,000 was raised through the Lottery Committee for the Improvement of Calcutta, whilst Rs. 50,000 was generously given by Raja Protap Ch. Singh. The ground on which it stood, of the value of Rs. 12,000, was generously given by Babu Mati Lal Seal."

With the opening of the new hospital and the introduction of physiology into the curriculum of medical study, the status of medical education was very much raised and the professors devoted better attention to the progress of their students. The number of applications for admission into the College was greatly increased, and there was a peculiar sort of craving amongst

the respectable class of students to learn medicine. When the rush became great, Government was pleased to withdraw their grant, but continued to give free tuition up till the year 1860. It was about this time the University Entrance Certificate was enforced as the minimum qualification of students soliciting admission into the Medical College. With the growing desire of people to learn medicine and the crying demands of the populace for medical help in cities, towns, and villages, it appeared in the wisdom of Government to open a vernacular class for the training of students who could understand the lectures, and write good Bengali and Hindustani. In 1850 a Bengali class was opened for the benefit of the tolerably educated Bengali youths. Every facility was given them to acquire sufficient knowledge of medicine and surgery, and the senior students were taken to the wards to listen to the clinical lectures given by the house-physicians and house-surgeons of the Hospital. In 1873 the Vernacular Department was isolated from the Medical College, and it was most fittingly engrafted in the pauper hospital at Sealdah, where better facilities were offered to the students to learn the practical portion of their work. The entire institution was named after Sir George Campbell, the then Lieutenant-Governor of the Province, and at whose instance this wholesome change was effected. The students who passed out of the Medical College were designated as Graduates of the College, and were all provided with Government appointments. They were called Sub-Assistant Surgeons. Although at this time the field of private practice was extensively wide, still, for obvious reason, the graduates preferred Government appointments. When the medical examination was made over to the University, the College authorities ceased to grant their own diplomas and the students, who entered the Medical College with Entrance Certificates, were, after passing their final test, granted the diploma of L. M. S., and those who took their admission into the College after passing the First Examination in Arts were granted the degree of M. B. The same examination decided the fate of L. M. S. and M. B. candidates. The difference was that the M. B. had to answer a separate paper on comparative anatomy. The students who passed from the Vernacular Department were called Civil Hospital Assistants. They were also called V.L.M.S.

With the progress of medical education, the treatment of the sick has undergone much improvement. It would, I fear, be an encroachment upon your time and patience if I were to deal with the subjects in detail. I would, therefore, keep myself content by speaking a word or two on the very wholesome changes which both the Hospital and College have undergone within the last forty years. The students of the College and the younger generation of alumni will be surprised to learn that cases in the medical ward were diagnosed on clinical evidence, and although the examination of blood, and

knowledge of bacteriology was not known to the professor, still in more than two-thirds of the cases the diagnosis proved correct. In cases of death the autopsy demonstrated the truth of the diagnosis. The etiological portion of the disease was, however, left in the dark. The knowledge of bacteriology, hæmalysis and blood counts was unknown to the professors, still, in spite of this sad drawback, the percentage of recoveries was not at all discouraging, and bears fair comparison with the percentage of the present age. The flooring of the wards was kept dry and sweet by the dusting of McDougal's powder. A basket of charcoal was hung over each bed, there being 16 beds in each row. The nursing arrangements were not half so satisfactory. The house-surgeons were responsible for the food and comfort of the patients. In important cases medicines were administered by the students on duty.

In the surgical wards the atmosphere was surcharged with emanations arising from hot linseed poultices and from foul sores: A thing inconceivable to the students of the present age. Treatment of both medical and surgical cases has since been greatly altered.

From the early seventies poultices were replaced by scientific dressings and the charcoal baskets were removed for good. Hospital gangrene, osteomyelitis, erysipelas, pyæmia, and puerperal fever were made things of the past. Every surgical operation was performed under the carbolic acid spray, at a strength of 1 in 40, and the wounds were dressed with carbolised plaster, made of bandage cloth dipped in carbolic acid, shellac and castor oil. A piece of guttapercha tissue was placed directly over the wound and above it was placed seven layers of such plaster with another piece of guttapercha tissue underneath the last layer. A thick layer of antiseptic cotton wool or oakum was placed above the carbolic plaster, and the whole then bandaged with cloth soaked in carbolic lotion. Instruments used for operation and dressings were all placed in a saturated solution of carbolic acid. With the progressive changes introduced by eminent men the treatment of surgical cases was materially changed, the age of india-rubber, glass and catgut drainage was introduced, and the seven layers of carbolised plaster and guttapercha tissue were replaced by boric ointment and antiseptic gauze. The carbolised lotion was replaced by perchloride of mercury lotion. The spray was done away with, which was a great relief to the students who had to use it during operations and the dressing of wounds. Ounces of ointment were sometimes required for each dressing. The antiseptic age was soon followed by asepsis.

Tincture iodine and alcohol have taken the place of perchloride of mercury lotion. The results of the new methods of treatment have been extremely satisfactory. The death-rate has been surprisingly reduced, from 35 per cent. to 1½ to 2 per cent. It is not for me to tell you

anything about the present working of the Hospital under the new procedure and scientific methods which in one word could be said to be ideal. This is not the place to deal with the questions relating to the use of emetine in amoebic dysentery or hepatitis, nor need I tell you about the triumph of saline treatment over all other recognised methods in the treatment of cholera; nor is it the time to argue on the relative value of the treatment of tuberculosis by tuberculin injection. Every necessary arrangement has been made to impart efficient teaching to the student of the present age. The Anatomical Theatre has been so altered as to offer every facility to the student of anatomy. A whole-time professor has been appointed to devote his whole time to the work of the subject he has to profess. Besides there are a sufficient number of demonstrators to help the students in understanding the subjects. In the physiological department the professor teaches the students in a most practical way, and as each student is provided with a microscope, he can profitably utilise his time with it. Now, gentlemen, we have so far been able to establish the fact that the institution has undergone material change and alteration in its constitution ever since its organisation. Blessed are the students who take their admission into this College. Blessed are those who come out successfully after finishing their prescribed course of study. Now let me speak a word or two on the future of our medical students. The prospects of the medical profession, my young friends will please understand, are very limited, and the path which leads the way to success is not very smooth. The question of expense is not to be trifled with. In Calcutta the medical students are mostly recruited from middle class people, whose incomes fall considerably short of their actual requirements. Some of the students have to depend upon the charity of their more fortunate brethren. Whatever grade and station of life the student may belong to, he must be diligent and painstaking. His ambition should be to win the confidence and affection of his professors, who are generally interested in his progress in the class and in his future success in the world. It is a silly mistake to think that the professors are least concerned in the success or failure of their students and that their relations with them cease with the completion of their college study. The relations I may, without fear of contradiction, say remain life-long. They keenly watch your progress through the world, they rejoice at your success and feel regret at your fall and disappointment. It has become painfully evident that the results of the Medical Examinations of the present day are less satisfactory than what they were before. The students attribute their disappointment to the undue strictness of the examiner, their friends to an inefficient teaching, and professors to the lethargy of their pupils. It is proverbially known that diligent students never encounter failures. The students who are indifferent to their study bring

disappointment to themselves. They become lethargic and ultimately give up study altogether. By their constant association with irresponsible classes of men they easily contract the habit of mixing up with agitation of all kinds, and thus ruin themselves and their families.

I would now attempt to speak on the prospects of successful students, who after completing their medical study intend to enter the world as professional men. Before establishing himself in practice the young doctor should consider the difficulties that stand in the way to success. In Calcutta and its suburbs the income of a beginner is quite inadequate, and sometimes he fails to meet his ordinary expenses. Unlike other professions, the medical practitioner at the beginning of his practice has to advise patients free of all charge. The majority of our countrymen are poor, and as such can ill-afford to meet the expenses necessary for good medical treatment. The prospect of medical men in the Government and Municipal services are equally discouraging. As a senior member of the profession, I would advise my young friend to try his best to secure a hospital appointment. If he cannot succeed in getting one, he must continue to attend the wards of the Hospital to keep himself in touch with its work, and to listen to the clinical demonstrations given by his professors. He must, as well, attend the operating theatre during operations. In his professor he would find all the attributes of a good governor and a kind patron. I must remind my young friend that to pick up practice in Calcutta requires time and patience. When our young friend has decided to establish himself in practice, he must consider whether he would like to specialise in some special branch of medicine, or would like to be a general practitioner. If he prefers medicine and wants to establish the reputation of a physician, he must try to equip himself with a full knowledge of the topographical and structural relations of the organs. He must know the relative position of the organs in their normal state before he can venture to make out their morbid changes. He must also know the physiological effects of medicine. In writing our prescriptions he must know the compatibilities and incompatibilities of medicine. It would be necessary for him to know that after a definite period of life the arterial and capillary systems of the body undergo certain morbid changes, and as a sequel to these changes the myocardium of the heart, and the tubules of the kidneys undergo marked changes. These pathological changes are very common amongst people of our country after they have attained the age of forty. I do not mean it to be understood that the tender-aged are immune from such changes, for they are sometimes noticed amongst young boys who are scarcely out of their teens. To acquire a knowledge of these things would require a young practitioner to work as assistant under a senior member of the

profession. A senior member of the profession does not necessarily mean an elderly man in the full possession of his wealth, but a man of much experience and knowledge. That is an up-to-date man. The best practitioner is he who looks to the safety of his patients first, secondly his reputation, and last of all his own remuneration. It is also necessary for him to know that the safety of his patient depends absolutely on the correct diagnosis of disease. His reputation depends upon the care he takes of his patients, and his remuneration upon the means of his patients. The young physician must acquire the habit of handling a patient gently, as roughness in manipulation complicates matters and masks the actual disease. If my young friend wants to feel the border of the spleen or the liver, he must know that rough handling of the muscles of the abdomen causes them to contract and complicate the whole procedure. The young practitioner must always keep himself ready to cope with medical emergencies. Delay in such cases seriously tells upon his prospects; he must be prepared to meet the emergencies which he is likely to meet in practice.

He may be suddenly summoned to attend a case of cholera, hæmorrhage of the bowels, cardiac failure, hæmoptysis, apoplexy, angina pectoris, infantile convulsions, and poisoning of all kinds. During emergencies people would resort to a doctor who is near at hand, it not mattering whether he be a junior or senior member of the profession. If the young practitioner intends to practise surgery, he would do well to act as an assistant to a senior practitioner and help him during operations, and charge no fee for his services. This would enable him to get frequent calls from his seniors. If he is fortunate enough to win the confidence of his patrons, by his assiduity and diligence, he may then expect to get charge of the after-treatment of patients. Besides acting as a junior to a busy practitioner, he must have sufficient knowledge of modern surgery and not allow his knowledge of anatomy to get rusty, for anatomy forms the groundwork of surgery. He must also practise the art of diagnosis. To come to a correct diagnosis of a surgical disorder the doctor has to trust to his own eyes and hands, and never be misled by the version of his patients. In this country patients generally suppress facts which may not be pleasant to tell, lest they cause suspicion as to his morality. Most of the surgical cases can be diagnosed at sight. Looking at the position of a limb and comparing it with its fellow, from its position, its deviation from its normal appearance, it can be at once said whether the patient has sustained fracture or dislocation. From the unconscious state of a patient with hæmorrhage, or oozing of blood, from the nose and ears it can be at once said whether the patient has sustained fracture of the base of the skull. To acquire the habit of seeing things correctly, the junior must first try to see things through the eyes of his senior and then practise to see

things with his own eyes. Unskilful handling is always resented by the patients; what would you do in a case of inflamed joint with a considerable amount of effusion within it? If you roughly handle the joint, you gain nothing, but on the contrary you run the risk of losing the confidence of your patient, who would never allow you to manipulate it again. There must be method in your manipulation, and the examination of a joint should be made in due relation to the anatomy of the part. You must know about the movements which are first interfered with in joint diseases, and what movements are first restored to the joint after the inflammation has subsided. But these things cannot be learnt from mere reading of books. You require a guide to teach you at the bed-side. Your professors have told you everything and you have locked it up in your brain, but you do not know how to use that knowledge in practice. You must also be well prepared to meet surgical emergencies. If you want to practise obstetrics, you cannot do better than act as a junior to a specialist. You must thoroughly know the anatomy of the pelvis. You must know the mechanism of instruments generally used in obstetric and gynecological cases. You must learn the mechanism of labour betimes. These are mere general hints which I would give you for your guidance in practice. Taking into consideration the time limit I cannot venture to deal with these subjects more minutely. With the progress of time and advancement of knowledge the treatment of diseases has undergone much change. The age has come when diseases are treated with a minimum of medicine and maximum of hygiene. Vaccines and serotherapy are the order of the day. But it is a matter very much to be regretted that there is a growing tendency of modern batches of practitioners to overdo things. It must be admitted that in some cases they have done wonders—and in most cases they have failed. Tuberculin treatment has not been successful in my hands and I have discarded it altogether. But that is no reason why I should not advocate its cause. Sir Leonard Rogers, Col. Deare, Rai Bahadur Dr. G. C. Chatterjee and Dr. J. N. Sen Gupta have been favourably impressed with the curative value of tuberculin in phthisis. From facts brought to us every day we are more than convinced that under certain circumstances the body acquires a power by which it can protect itself against infection. The problems of immunity are so complicated in their nature that they do not come within the purview of students who are preparing for their examination. The study of immunity and specific therapy should be included in Post-graduate courses. It is hardly necessary for me to tell you, gentlemen, that it is a duty incumbent upon you to look to the comfort of your patients, to look to the prestige of the profession you have so wisely chosen to follow, to prove yourself absolutely loyal to your College and to your Government, which has established this institution for your good and for the benefit of

its subjects. Never for aught in the world, stoop so low as to embrace other systems of treatment for your worldly interest.

Heartily wishing you, my young friends, a bright and prosperous career in your life, I bid you good-bye for the present.

RECENT RESEARCHES ON HOOKWORM INFECTION IN INDONESIA.

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THIS paper is prepared from data obtained in Malaya and Java in 1915 and 1916, by the Malaya Board working under the auspices of the Colonial Office and the Rockefeller Foundation and by the support of the latter.

The work was, in part, done in association with my colleagues Dr. M. A. Barber and H. P. Hacker, and, in part, with the aid of Dr. M. E. Barnes.

I alone am responsible for the opinions as they are expressed in this paper.

The members of the Board were placed under great obligations by the kindness of planters, administrators, and doctors in Malaya, Java, and Sumatra, and I feel especially indebted to Dr. Chas. Lane Sanson, C.M.G., F.M.O., Fed. M. S.; Hon. W. Gilmore Ellis, P.C.M.O., Straits Settlements, and to Den Hogg, Ed. Gestr., Herr Dr. de Vogel, Chef Geneeskundigen Dienst, Netherlands Indies, for having so generously placed at my disposal facilities for pursuing the work.

The problem of the Malaya Board was to ascertain to what extent hookworm infection was a menace to the health and working efficiency of the people of the Malay Peninsula.

It was necessary, therefore, in a country where malaria of the most severe type co-existed with hookworm infection usually reaching an incidence among adults of 90 to 100 per cent., to attempt a quantitative estimation of the gravity of each infection.

It was impossible to do this in the Malay Peninsula until we had accumulated a large number of cases, so that the errors due to small numbers of cases might be minimized.

The first opportunity we had to make a numerical estimation of the blood loss or anemia caused by hookworm was in Java.

Twelve surveys were made in Java in 12 different localities in order to determine, in a variety of locations, the incidence of infection (number of persons harbouring hookworms); degree or intensity of infection (number of worms being harboured by each individual) and the presence or absence of malaria.

The population was assembled, spleen and parasite rates and hemoglobin contents were

ascertained, on a large number of people, then a representative sample of this population, men, women and adolescents, based on hemoglobin readings was selected for treatment and worm count.

Special arrangements were made for saving stools, and the work of treatment, stool washing and worm counting was done by myself or under my direct supervision.

The Java data indicate that in regions where there is uncomplicated hookworm infection, *i.e.*, uncomplicated by malaria, some people may harbour a number of hookworms without showing any measurable degree of anemia. There are other groups of persons in other communities with a large number of worms, and a definite measurable amount of anemia. Still other smaller groups of persons present anemia of severe grade and harbour a still larger number of worms.

In the higher grades of hookworm infection, when the numbers run into hundreds, it is possible by comparing two groups of infected persons, whose hemoglobin contents differ by several degrees, to note that a given number of hookworms causes a certain degree of blood loss that the host is unable to counterbalance, or make good. The greater the number of worms the less able is the patient to compensate for losses. As losses are going on in the cases with the moderate and high grade anemias, which are measurable in each case, we assume that in lighter and lighter cases of infection, gradations of losses are also going on which are *pari passu* lighter and lighter, but are counterbalanced because we are unable to measure them.

The effect of the small complement of hookworms not causing anemia is counterbalanced so long as the reserve powers are not interfered with, but if these are weakened or broken down by severe malaria, underfeeding, exhaustive labour or other cause, the losses of blood due to hookworms might not altogether be made up and would probably cause measurable anemia.

In the presence of another cause of anemia it would be difficult to measure the degree due to hookworms. But if 250 hookworms cause sufficient blood loss to make a measurable degree of anemia, it is reasonable to suppose that 50 worms would cause a blood loss one-fifth as great whether counterbalanced or not.

We found that individual cases of infection could not be compared, one with another, because of individual variations in the hemopoietic powers. When a number of cases were classified and compared it was seen that there was a positive correlation between degrees of anemia and numbers of worms in the different classes. It furthermore seemed possible to work out a factor which would express the amount of anemia caused by a given number of worms. There were certain difficulties to be recognized, met and overcome before this could be accomplished.

It was necessary to make a careful comparison of sex and age groups, for it is impossible to assign with accuracy a single standard for the average hemoglobin of a population.

There is the disparity due to sex. Among adults the hemoglobin of women is 86.5 per cent. when that of men stands at 94.8 per cent.

The standard varies at each decade of life.

For example, the average for a number of Chinese boys was :

Age group	5 to 7	8 to 10	11 to 13	14 to 16	17 to 19
Cases	16	129	57	59	5
Average hemoglobin	74.0	80.1	80.3	81.4	86.0

Among the kampong people the highest point in the hemoglobin wave is reached during the third decade of life 20 to 30 years. Lower values begin to show themselves in the next decade. After the 50th year a very decided drop occurs, in which averages similar to those of childhood occur.

The effect of pregnancy lowered the hemoglobin some 15 per cent. below that of non-pregnant women in the kampong.

In attempting to derive the normal average hemoglobin of non-infected persons for age and sex group in a people all more or less infected with hookworm the people were first collected and treated, and later separated into such age and sex groups.

In the kampong, where there was considerable malaria, it was observed that there was no close correspondence between the degree of anemia (which was severe) and the number of hookworms harboured, as disclosed by treatment and worm count, but in the kampongs free or nearly free from malaria there was a very high positive correlation between the degree of anemia and the number of hookworms, when averages, and not individual cases, were compared.

The standard hemoglobin for the particular age or sex group was obtained by taking the people treated in the malaria free kampongs and separating them into age and sex groups. By comparing sets in the heavily infected kampongs with sets in the lightly infected ones a standard could be derived for the particular age or sex group.

The problem stated : The average hemoglobin of the boys in kampong K. is 71.5 per cent. and their average worm count is 196. The average hemoglobin of boys in kampong B. is 82.0 per cent. and their average worm count is 20.7. What should be the average hemoglobin or standard of a similar sex and age group, whose worm count is 0.0?

There was sufficient data available to work this out for boys as well as for men and women.

Men.—The standard for men was worked out by first plotting the average hemoglobin and the average number of worms obtained from the men of Kalimaro, next plotting the same for the men of Kabasekan. A line from the first through the second intersects the line of no worms at the point represented by approximately

95.0 per cent. hemoglobin, and this is the average normal hemoglobin as calculated with the instrument used (Dare's instrument).

It is more accurate to express hemoglobin in grammes but percentages are more conveniently used. Besides, the instrument is designed to be read in percentage.

MEN.	Kalimaro.	Kabasekan.	Calculated hemoglobin for no worms.
Number of cases	9	10	
Average hemoglobin	62.8	74.9	94.8
Average worm content	378.4	235.5	0.0

This calculated standard 94.8 was rarely found among the kampong men, for there were three or more causes tending to lower their hemoglobin : namely, malaria, hookworm infection, and underfeeding.

The standard was approached, however, in a group of Chinese and Malays in the Stadsverband, Batavia. They were beriberics, living in a screened hospital ward, well fed and, on account of physical disability, unable to work. Their average hemoglobin was 92.3 per cent.

WOMEN.	Kabasekan.	Kramat.	Calculated hemoglobin for no worms.
Number of cases	8	5	
Average hemoglobin	69.7	85.6	86.5
Average worms	163.3	9	0.0

Boys, 1.	Kabasekan.	Kramat.	Calculated hemoglobin for no worms.
Number of cases	9	14	
Average hemoglobin	71.5	82.3	84.9
Average hookworms	106	80.7	0.0

In the case of women and boys from Kramat the worm counts were very low, the loss of hemoglobin may have been compensated and the amount registered normal. In that case the normal standard of hemoglobin for women and boys would be 85.6 and 82.3 respectively. With the men, however, there was definite measurable anemia in both groups and high worm counts.

We may now get some idea of the amount of anemia caused by a given number of worms by dividing the average loss of hemoglobin in any age or sex group by the average number of worms actually found to be harboured by the group.

Boys, 2.	Kalimaro.	Batavia.
Age	9.7	9.2
Number of cases	9	14
Normal average hemoglobin, boys	85	85
The average hemoglobin of boys treated in kampongs	71.5	82.3
Calculated loss	13.5	2.7
Average number of worms	106	20.7
Calculated number of worms required to produce a loss of 1 per cent. of hemoglobin	7.8	7.6

Here it is assumed that a few worms will cause a slight amount of measurable anemia. This is probably not true.

Men.	Kabasekan.	Kalimaro.
Number of cases ..	10	9
Calculated normal average hemoglobin ..	95	95
Average hemoglobin of men treated in the kampongs ..	74.9	62.8
Calculated loss ..	20.1	32.2
Average number of worms	235.5	378.4
Calculated number of worms required to produce a loss of 1 per cent. of hemoglobin ..	11.7	11.7
Women.	Kramat.	Kabasekan.
Number of cases ..	5	8
Calculated normal hemoglobin ..	86.5	86.5
Average hemoglobin of the women treated in the dessa ..	85.6	69.7
Calculated loss ..	0.9	16.8
Average number of worms	9	163
Calculated number of worms required to produce a loss of 1 per cent. of hemoglobin ..	10	9.7

Thus it would appear that in hookworm infection, when measurable amounts of anemia are produced, 1 degree of anemia or the loss of 1 per cent. of hemoglobin is caused by about 10 worms in women, 7.6 worms in boys (nine years of age), and 11.7 worms in men.

These factors may be used in a community in estimating the amount of anemia or blood loss caused by hookworm in the presence of malaria or other cause, as hard labour and underfeeding.

In one of the penal institutions in which we worked there was malaria and hookworm infection. The hemoglobin average of the men at hard labour was distinctly lower than that of the clerk prisoners. The latter body of men were subjected to identical conditions of food, shelter, exposure to malaria, and hookworm infection, but their hemoglobin average was 8.2 per cent. higher than their mates at hard labour.

An estimate of the amount of anemia caused by three factors, malaria, hookworm infection and hard labour, is displayed in the following table :—

	Kampong-Endil.			Kabasekan-Kalimaro.		
	Men.	Women.	Boys.	Men.	Women.	Boys.
Calculated hemoglobin normal standard ...	95	86	85	95	86	85
Actual average hemoglobin of the treated dessa folk ...	64.2	53.1	59.3	69.2	69.7	71.5
Estimated loss total ...	30.8	32.9	25.7	25.8	16.3	13.5
Average number of hookworms	48.6	51.5	84.3	303	163.3	106
Calculated loss of hemoglobin due to hookworms, using the factor ...	4.1	5.1	10.8	25.8	16.3	13.5
	Spleen rate 100	Endemic index 12.				
Balance due to losses from malaria ...	26.1	27.8	14.9	Malaria not present.		
Loss due to hookworm ...	4.1	5.1	10.8	25.8	16.3	13.5

109 CASES TREATED.

We assume their normal standard hemoglobin should be ...	95%
The average hemoglobin of the 109 men actually was ...	69.2%
Balance = loss due to various causes ...	25.8%
Deducting that assumed to be (and undoubtedly) due to hard labour. Difference between 85.3 and 77.3 = ...	8.0%
Balance due to malaria and hookworm infection ...	17.8
Average number of hookworms harboured per man = 79.5, this when divided by hookworm factor 11.7 = 79.5 ÷ 11.7 = 6.8 and represents the amount of anemia due to hookworms among the treated group ...	6.8
Balance due to anemia caused by malaria ...	11.0

The allocation of the loss due to hookworm infection of different degrees of severity is displayed in the following table :—

Number of worms.	0 worms	1 to 100	101 to 200	201 to 300	301 to 400	401 to 500 +
Calculated normal hemoglobin ...	95	95	95	95	95	95
Loss due to hard labour, i.e., difference between 85.3 and 77.3 ...	8	8	8	8	8	8
	87	87	87	87	87	87
Estimated loss due to malaria (obtained by taking the average hemoglobin of 6 men not infected with hookworms, i.e., 76.5%) =	10.5	10.5	10.5	10.5	10.5	10.5
Balance ...	76.5	76.5	76.5	76.5	76.5	76.5
Average hemoglobin in the worm groups treated cases	76.5	75.3	62.7	67.4	50.0	37.5
Calculated loss due to hookworm infection in the different groups ...	0.0	1.2	13.8	9.1	26.5	39.0
Number of men in group ...	6	74	16	7	4	2

With the use of the factor we may now ascertain in any given kampong where both diseases co-exist, how much of the anemia is due to hookworm and how much to malaria :—

In order to estimate the degree of anemia caused by hookworm in a mixed population of Chinese, Tamils, Malays, and Eurasians, and consisting of men, women and children many of whom had been exposed to malaria, they were arranged in worm groups as is seen in the following table.

The table represents a large series of treatments carried out in prisons, hospitals, estates and schools, altogether 818 persons, as follows :

Chinese, Men	402	Women 20	Children 6=	428
Tamils, Men	138	Women 34	Children 62=	234
Malays, Men	24		Children 74=	98
Eurasian			Children 58=	58
<hr/>				
818				

WORM GROUPS.

	0 to 5	6 to 50	51 to 100	100 to 150	151 to 200	201 to 250	251 to 300	301 to 600	600
Number of cases ...	244	351	112	44	18	15	10	17	7
Percentage distribution of cases in different groups ...	29.8	42.9	13.7	5.4	2.2	1.8	1.2	2.1	0.9
Average hemoglobin...	82.5	80.5	74.9	74.5	69.8	58.2	59.9	54.7	38.7
Estimated average loss of hemoglobin (anemia) due to hookworm ...	0.0	2.5	7.6	8.0	12.7	24.3	22.6	27.8	43.8

The average loss of hemoglobin due to hookworms is estimated by subtracting the average hemoglobin of the different worm-groups from the hemoglobin of the group containing the smallest number of hookworms (0-5 worms), i.e., 82.5 per cent.

It is seen that the anemia increases in severity with the increase in the average number of worms harboured.

Taking the series as a whole the average loss of hemoglobin per individual was 4.3 per cent.

The average number of hookworms harboured was 53.1.

That there subsists a relation between degree of anemia and number of worms harboured and that this is affected by the species of worms and by the age and sex of the person, the following table clearly shows :—

	Number of cases.	Average loss of hemoglobin. per cent.	Average number of worms.	Ratio of loss of hemoglobin to worms.
Cases without evident malaria ...	663	3.2	45.8	1 : 14.3
Cases with evidences of malaria	155	5.9	84	1 : 14.2
Cases in Chinese, preponderance of ankylostomes ..	361	1.4	22.1	1 : 15.8
Cases in Tamils, preponderance of necators ..	172	5.3	106	1 : 20
Cases in men ..	459	1.7	41.4	1 : 24.4
Cases in women ..	44	9.9	98.9	1 : 10
Cases in children	160	5.3	44.5	1 : 8.4

Thus in our series of cases in the Malay States we estimated that somewhat fewer worms were

required to cause a certain degree of anemia among Chinese than among Tamils, and we believe that this is due to the greater malignancy of *A. duodenale* than of *N. americanus*, which the Chinese harbour in larger numbers than do the Tamils.

We observed also that fewer worms were required to produce a degree of anemia in children than women, and fewer in women than in men.

The effect of hookworms in causing anemia was no greater in cases of malaria than in cases without evidences of malaria, in other words they do not intensify unduly the anemia due to malaria but simply exert their own powers in the same degree as they would if they were not complicated by malaria.

These figures taken from the Malaya Board Report show very strikingly the correlation between anemia and hookworms.

They show also the measurable loss of hemoglobin due to different numbers of worms and they lead to the highly important conception that the same deleterious effect in causing loss of blood is exerted by few worms as by many, but this effect while present and acting as a drain on the blood-forming organs and bodily forces, is not apparent and discoverable by scientific methods. We have to assume its taking place. The assumption, however, rests on very good data.

Having shown that the anemia caused by hookworms depended on the number of worms harboured, we may now show what the measurable advantages will be when a population infected with hookworms is subjected to treatment. The advantages will accrue to the individual as better health, and, in the case of coolies or plantation labourers, to the employers of labour as increased efficiency and less cost for hospital services.

The information derived from this aspect of the subject is of great value to the planter for the benefits of treatment may be demonstrated quantitatively.

The cases here presented were coolies entering the Federated Malay States nearly all infected with hookworm, and some with malaria.

Some were given hookworm treatment, the remainder serving as controls. Later, after residence on rubber estates, they were re-examined to note the effect of treatment, or of recently acquired malaria on their condition.

The data highly important as they are can only be summarized or tabulated here :

Cases with signs of malaria subsequent to arrival.

	Treated at Quarantine Depôt.				Not treated at Quarantine Depôt.			
	No. of coolies.	No. of cases.	Total change in hemoglobin.	Average change.	No. of cases.	Total change in hemoglobin.	Average change in hemoglobin.	
Cases with malaria after arrival ...	72	28	-159	-5.7	44	-457	-10.4	
Cases with no signs of malaria after arrival ..	162	41	+624	+15.2	121	+730	+6.0	

Here the advantage of giving a preliminary hookworm treatment before sending the coolies to the estate is very clearly shown.

When they go to a malarial estate and contract malaria their blood loss as shown in the recorded anemia is not so great as it would have been had they not received treatment.

We may refer here to the necessity of bearing constantly in mind the fact that malaria and hookworm infection are often associated, and co-operate in causing the anemia of peoples in tropical and sub-tropical lands.

The overpowering nature of malaria in causing anemia is well shown in the following table in which the amount of anemia on an estate is directly related to the incidence of malaria, as disclosed by the blood and spleen tests and irrespective of the associated hookworm infection. That is, in addition to the anemia already caused by hookworm, an additional and increasingly heavy burden is placed on the blood-forming organs as the degree of malaria increases.

The gross average change in hemoglobin in the coolies after residence on the estates, irrespective of treatment or new infection with hookworm, is noted, in relation to the incidence of malaria in the same estate.

Relation of incidence of malaria to degree of anemia irrespective of hookworm infection.

	Estates.	Total cases.	Average change in hemoglobin.	Cases with evidence of malaria.	Percentage incidence of malaria in each group.
With gain of over 10 per cent. .	3	39	+11.6	8	8 in 39 cases or 20.5 per cent.
Gain of 5 to 10 per cent. ..	4	87	+7.2	25	25 in 87 cases = 28.7 per cent.
Gain of 0 to 5 per cent. .	4	92	+1.88	43	43 in 92 cases = 48 per cent.
Loss of 0 to 10 per cent. ...	1	24	-2.1	16	16 in 24 cases = 66.7 per cent.
Loss of 10 to 20 per cent. ...	1	11	-11.4	9	9 in 11 cases = 81.8 per cent.
Loss of over 20 per cent. ...	1	14	-21.3	14	14 in 14 cases = 100 per cent.

The benefits derived from treatment are real though somewhat obscured by the more severe anemia caused by malaria. Thus :

(1) When coolies free from malaria were treated for hookworm at the Quarantine Depôt and afterwards went out to non-malarial estates they were found to have gained 15.2 per cent. hemoglobin (41 cases).

When they were not treated they gained but 6.0 per cent. (121 cases). This may be interpreted as an advantage in favour of treatment of 9.2 per cent.

(2) When coolies free from malaria on admission were sent out to malarial estates and developed malaria, the ones treated for hookworms lost only 5.7 per cent. hemoglobin, while the untreated ones lost 10.44 per cent., an advantage in favour of treatment of 4.7 per cent.

(3) Coolies infected with malaria before arriving at the Quarantine Depôt gained 15.8 per cent., if treated before going to the estate but only gained 11.7 per cent. when they were not treated. This may be interpreted as a gain of 4.1 per cent. due to treatment.

There is the strongest reason not only for hookworm treatment in general, but for treatment of coolies at the depôt, during the voyage, or at the Quarantine Station, and previous to going on to a malarious location. For treatment removes the handicap placed on the blood-forming organs.

Agricultural populations usually subsist on an insufficient amount of a monotonous and unbalanced ration and they should be freed from unnecessary handicaps such as hookworm infection, particularly when they have to combat malaria.

The choice of a vermicide and its administration.—This is very important if it is desired to use a vermicide in the most efficient and economical manner and to extend its usefulness among a large infected population with as little delay as possible.

It must be emphasized that in using a vermicide, one is employing a drug poisonous to man as well as to the worm, and the object should be to narcotize the worms and expel them together with the administered vermicide as rapidly as possible to prevent injury to the host. Special attention should be paid to insuring free purgation after the post-vermicide purge has been given. It is imperative that several stools be passed within two or three hours after the administration of this post-vermicide purge. If necessary, a second purgative dose should be given.

Relative efficiency of various drugs in removing hookworms.—Preliminary tests with thymol and oil of chenopodium indicated very positively that in the dosages usually recommended—thymol 60 grains; oil of chenopodium, 48 minims, or 3 c.c.—thymol was the weaker vermicide. Confidence in the superiority of oil of chenopodium

in the earlier stages of the work was based on necropsy findings, in which was noted the number of worms found in six cases in which the patients had received the maximum dose of oil of chenopodium, 16 minims (1 c.c.) three times and who had died later of tuberculosis, dysentery, diabetes, or peritonitis. The percentage of removal of worms in this small series was 99.4 per cent.

The relative value of vermicides was measured by noting the relationship between the number of worms removed by a drug and the total number of worms present. The total number of worms was found by giving full doses of chenopodium until, as far as possible, the stools were rendered negative for worms, or for ova on microscopic examination.

The experiments were carried out on batches of adult male prisoners chosen at random except for the fact that care was taken to balance the nationalities carefully, and not to compare a result obtained in Chinese with a result obtained in Tamils or Malays. This precaution is necessary in view of the fact that the Chinese harbour fewer worms and a greater proportion of ankylostomes than the Tamils or Malays, in whom most of the worms are necators, and because it is more difficult to remove ankylostomes than necators and more difficult to obtain a high percentage of worms by treatment when there are few than when there are many.

The method adopted was to administer first the remedy to be tried. This treatment was called the *trial treatment*. The worms removed by this treatment were carefully collected and counted.

After this, always at an interval of at least a week, a second treatment was given of oil of chenopodium, 1 c.c. in freshly filled capsules three times at hourly intervals. This was done to test the efficacy of the previous trial treatment by discovering the number of worms left behind after that treatment. A convenient term for this treatment is the *test treatment*. After the test treatment the stools were examined for ova, and in those cases that were found positive the patients were given an *extra treatment* of oil of chenopodium, 1 c.c. three times. The stools were again examined for ova, and if necessary, further treatments were given until, as far as possible, the stools were rendered negative for ova. These examinations for ova were always made a week after the treatment was given, and in most cases more than two weeks were allowed to elapse. This procedure avoids error due to any possible latency in ova production in the early days after treatment.

The total number of worms removed was added together; the percentage of worms removed by the remedy tried in the trial treatment gives a very fair idea of the efficiency of that treatment.

The preparation of the patients for these series was uniform throughout except, of course, in the batches used for finding the effect of varying the diet and the purge in a given treatment,

in which cases the dose was kept constant throughout. The preparation was as follows: The prisoners had their ordinary morning meal at 11 A.M., but at the afternoon meal, usually served at 3 P.M., kunji or soft rice gruel was given. At 4 P.M., 2 ounces of a concentrated solution of magnesium sulphate was given as a purge. This contains practically 1 ounce of the salt.

Next morning they had milk instead of their ordinary meal, and were given the treatment. The last dose of medicine was followed after an hour's interval by a second purge of magnesium sulphate, and then they were kept away from work, and were locked up in the cells except when let out for exercise.

The stools were collected at 2 P.M. on the day of the treatment and at 7 A.M. and 2 P.M. on the following two days. The stools were washed and examined for worms till the end of seventy-two hours, which usually gave six stools per patient.

At the end of forty-eight hours, those patients who had two consecutive stools with no worms in them were released, provided that in every case at least four stools had been washed and examined. When prisoners had no stools at a washing, they were given another saline purge.

Relative efficiency of several vermicides.—A comparison was made of four commonly used vermicides in moderate dosages.

Efficiency of various vermicides.

Treatment.	Valid cases.	Worms removed by first or trial treatment, per cent.
Betanaphthol, 20 grains, in capsules, 2 doses with 2 hours' interval	10	26.7
Eucalyptus, 30 minims, chloroform, 45 minims, and castor oil to 12 drachms, divided into two doses of 6 drachms each and given with 2 hours' interval	10	46.9
Thymol, 30 grains, in emulsion, 2 doses with 2 hours' interval	10	88.6
Oil of chenopodium, 1 c.c. in capsules, two doses with 2 hours' interval	8	96.15

In the comparison of drugs chosen and given in medium doses, oil of chenopodium is the most efficient.

Recent tests of betanaphthol in Brazil, carried out by Dr. Smillie, show that the efficiency of betanaphthol may be increased by increasing the dosage. Severe blood crises occur, however, in certain persons after the administration of the drug in large doses.

Difference in vulnerability of species to vermicides.—This was studied from the combined results of series in which oil of chenopodium was used as the vermicide. It was found that 96.8 per cent. of all necators present were removed by the first treatment, as compared with 76.6 per cent. of all ankylostomes. This shows that necators are less resistant than ankylostomes to

a dose of vermicide. The resistance of both species of worms increases with the size of the worm.

The species formula or proportion of *Ancylostoma duodenale* to *Necator* varies in different classes of persons. In the Southern States *Necator americanus* according to Dr. Stiles, is the species always encountered.

With Japanese, Chinese, North Indians, West Indians, etc., the percentage of *A. duodenale* to the total number of worms harboured runs up to 90 per cent. plus or minus. In Java two ethnic stocks long resident on the island had markedly different species formulas. In Brazil we find that only 2-4 per cent. of the hookworms are ankylostomes.

Efficiency of oil of chenopodium in various dosages.

Treatment.	Valid cases.	Worms removed by trial treatment per cent.
1. Oil of chenopodium, 1 c.c. in capsules; 3 doses at hourly intervals, or 3 c.c. ..	17	98.9
2. Oil of chenopodium, 1 c.c., in capsules; 2 doses with 2 hours' interval, or 2 c.c. ..	8	96.15
3. Oil of chenopodium, 2 c.c., in capsules; 1 dose only, or 2 c.c. ..	25	95.8
4. Oil of chenopodium, 0.5 c.c., in capsules; 3 doses at hourly intervals, or 1.5 c.c. ..	9	95.4
5. Oil of chenopodium, 0.25 c.c., in capsules; 3 doses at hourly intervals, or 0.75 c.c. ..	10	80

The optimum dosage used in our treatment, No. 1 in the table, is shown to be very effective as it expelled 96.9 per cent. of the worms.

The treatment by 2 c.c. in one dose was an attempt to decide whether the tedious division of the treatment into three doses was really necessary.

The final result of the single-dose treatment (two-thirds of the maximum dose) is highly creditable, with 95.8 per cent. removal of worms. It raises the question whether the troublesome division of doses is really necessary.

4. The group that received only half the maximum treatment, i.e., 1.5 c.c., lost 95.4 per cent. of their worms, and it was thought advisable to ascertain whether a second half-dose treatment would remove most of the remaining 5 per cent. of worms. There would be less toxic effect and less vomiting by this method of treatment. Accordingly a third series of treatments was carried out, in which two half-dose treatments of chenopodium were compared with two treatments of thymol in various forms. (Table 4.)

TABLE 4.—Comparison of two treatments of half the dose of oil of chenopodium with two treatments of thymol in various forms.

Treatments.	Valid cases.	Worms removed by both trial treatments, per cent.
1. Two treatments of oil of chenopodium, 0.5 c.c., in capsules, 3 times at hourly intervals, or 1.5 c.c. ..	39	99.03
2. Two treatments of thymol, in capsules, 20 grains, twice with 2 hours' interval, or 40 grains ..	23	83.4
3. Two treatments of thymol, 20 grains, in capsules with lactose, 20 grains; 2 doses with 2 hours' interval, or 40 grains ..	10	79.4
4. Two treatments of finely powdered thymol, 20 grains, twice with 2 hours' interval, or 40 grains ..	10	80.6
5. Two treatments of thymol, 20 grains and lactose, 20 grains, ground to fine powder; 2 doses with 2 hours' interval ..	18	84.4

In this treatment also, the superiority of oil of chenopodium over thymol in the doses given is well shown in that it removed 99 per cent. of the worms, while thymol removed 79 to 84 per cent.

The method of treating hookworm infection by giving two or three treatments of chenopodium, 1 c.c., can be highly recommended. It would be possible to treat the entire agricultural population of Southern India by this method without the necessity of examining the stools microscopically for ova, for nearly 100 per cent. of the people over 12 years of age are infected.

In one series thymol in large doses was given and an increase in efficiency noted.

	No. of valid cases.	Worms removed by treatment, per cent.
Thymol, 30 grains, 3 times, or 90 grains ..	19	97.8
Thymol, 40 grains, 3 times, or 120 grains ..	19	54.2
Thymol, 60 grains, 3 times, or 180 grains ..	9	96.5

Ninety grains of thymol in powder would seem to be the optimum dose for this drug. The increase in vomiting in the higher dosages interferes considerably with its efficiency.

Effect of varying the diet and of omitting the first purgative dose.—In this series the same dose of oil of chenopodium was given in all cases, but a different scale of diet was given to each group of ten patients all of whom were Chinese. Each group was sub-divided into five patients, one half receiving a previous purge, and the other half receiving no purge before treatment. All patients got the purge following the chenopodium treatment.

In this way we have two series of results to compare: (a) with the purge, and (b) without the purge in each of the following groups:—

Diet 1.—Full diet all through the treatment.

Diet 2.—Full diet all the day previous to treatment, but milk on the morning of treatment.

Diet 3.—Rice gruel (kunji) on afternoon of the day previous to treatment, but milk on the morning of treatment.

Diet 4.—Only milk during the day previous to treatment, and only milk on the morning of treatment.

Effect of varying the diet and of omitting the first purgative dose on the result obtained with oil of chenopodium.

Diet used.	With purge.		Without purge.	
	Valid cases, number.	Worms removed, per cent.	Valid cases, number.	Worms removed, per cent.
Diet 1.—Full diet all through the treatment ..	5	44.5	5	57.1
Diet 2.—Full diet all the day previous to treatment but milk on morning of treatment ..	4	88.7	4	87.5
Diet 3.—Rice gruel (kunji) on the afternoon previous to treatment, but milk on the morning of treatment ..	4	92	5	95.7
Diet 4.—Only milk during the day previous to treatment and only milk on the morning of treatment	12	78.7	14	56.3

There is a steady increase in the percentage of worms removed with the increase in amount of deprivation up to Diet 3, or the diet used in the routine preparation of cases. When the starvation is increased beyond this, a remarkable drop in the percentage of worms removed was noted.

Another group of twenty patients was treated with the extra deprivation Diet 4, and the drop in efficiency was confirmed.

We may conclude from this small series, first, that the initial purge may under certain circumstances be omitted without altering very much the efficiency of the chenopodium treatment. This would lessen the work of the dispenser and permit a larger number of people to be visited. Second, it is extremely important in order to exert the maximum toxic effect on the worms that food be withheld during the morning of administration, and that the evening meal before treatment be light and digestible, leaving little residue. The stomach and small intestines should be as free as possible from food or chyme whenever treatment is begun, for the latter seems to lock up or absorb some of the chenopodium leaving a smaller portion to come in contact with the worms.

SURGICAL PROBLEMS AND DIFFICULTIES IN THE TROPICS.

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Kasauli.

IN this article I shall endeavour to draw attention to a few of the difficulties which the operating surgeon has to meet and overcome when treating surgical cases in a tropical country like India. I wish it to be understood that my experience is confined almost entirely to operations performed on British troops and civilians and also on Turkish prisoners of war. Possibly some of my remarks do not hold good when applied to operations performed on Indian soldiers and civilians.

There is a general belief in England that chloroform is the only anæsthetic that can be administered on an open mask in India. This was put to the test in the 34th General Hospital, Deolali, in 1916, and it was found that ether given by the open method acted almost as well as it does in England; but possibly a little more had to be administered, especially if a preliminary dose of morphia $\frac{1}{4}$ gr. and atropine 100th gr. had not been administered half an hour before the anæsthetic was commenced. The temperature in the shade at Deolali during the hot weather goes up to 104–106. It is quite probable that at temperatures of 110–116 the administration of open ether might present insuperable difficulties, but this should not be made an excuse for the complete abolition of ether from the operating theatre during the cold season.

When one comes to the actual operating the temperature of the theatre again becomes an important matter from the point of view of both the operator and his patient. The surgeon has to decide whether the discomfort caused by the wearing of a head-gear and face mask is more than compensated for by the increased protection afforded to the patient. By wearing these articles the amount of perspiration lost by the operator is certainly increased; but on the other hand, there is less danger of any dropping into the operation area. Personally I consider that the latter advantage outweighs the disadvantages, and I now invariably use both a head-gear and a face mask when operating. It is often stated out here that, even if a few drops of perspiration did accidentally fall into the wound, very little effect would be produced on the way it heals; but I doubt if this statement ought to be accepted as a fact, and it would certainly not be readily accepted if the operator happened to have a number of boils or pimples on his face.

The technique of the actual operation has to be modified to meet the abnormal way the tissues react to trauma. This brings in the question of oozing into wounds, incisions, etc. It is soon realised by the surgeon that far more bleeding points have to be tied in any ordinary operation performed in the tropics than in the

same operation carried out in England. Moreover the tendency for oozing to take place after the operation, and even after the removal of the stitches, has to be taken into account in applying the dressings and bandages. From the above remarks it is clear that collodion dressings should never be employed after any operation, or even after the removal of the stitches.

Oozing is more pronounced during the monsoon season, and like many other unexplained physiological phenomena in India, is put down to the patient's "thin blood." A careful inspection of the blood lost during an operation shows that there are definite reasons why the expression continues to be used. The blood undoubtedly appears to be paler and more fluid than blood in England and it certainly does not clot so quickly : facts which readily explain why it is necessary to tie every bleeding point encountered during an operation, and to apply firm bandages afterwards.

This subject has an important bearing on operations on joints; more especially the removal of loose cartilages or bodies from the knee joint. However, if Sir Robert Jones's advice "to use a tourniquet" is followed, the actual operation presents no more difficulties than when carried out in England. It is unnecessary to add that all vessels external to the synovial membrane should be tied; and before a tourniquet is removed, the knee should be firmly bandaged over a thick layer of wool, extending about 3-4 inches beyond the limits of the joint capsule. This dressing is left on until the stitches are removed on the 7th or 8th day. When the above instructions have been carried out the results show no appreciable differences from the results obtained in England.

There is a generally accepted belief in India that individuals who have contracted malaria make bad subjects for operative treatment. The reasons for this belief are not hard to discover. In the first place, the anæmia following an attack of malaria aggravates the oozing into the wound; and this is a matter of importance when operating on organs where it is impossible either to tie all bleeding points or to apply the requisite degree of pressure after the operation, *e.g.*, operations on the liver or intestines.

In the second place it is soon realized by the surgeon that an operation, even a minor one, will almost certainly precipitate an attack of malaria. Charts 1 and 2 give some idea of what generally happens. Sometimes the patient has never had a previous attack, and never knew he had been infected; or he may have gone for several years without an attack, and thought he had completely got rid of his malaria. The most important factors concerned in precipitating the attack are still matters of personal opinion. There are obviously three possibilities. The attack may be precipitated by—

- (1) the mental worry,
- (2) the actual trauma,
- (3) the action of the anæsthetic.

Regarding the first, it is fair to state that I have actually seen attacks precipitated in patients who have been told that they were to be operated on next day, but for some reason or other they were not operated on. Why undue mental activity should cause increased activity of the malaria parasite is a problem which may possibly interest the pathologist and physiologist of the future.

The influence of trauma is well known to all surgeons, as any injury, such as the fracture of a bone, in a malarial subject is often followed by a recrudescence of the disease.

It is obviously impossible to estimate the effect of the anæsthetic in stimulating the activity of the parasite. Cases are known where a malarial attack has followed an examination under an anæsthetic, but here, of course, one cannot eliminate the influence of the accompanying mental disturbance.

It is quite obvious that all these factors interfere with some mechanism which keeps the parasite under control. It is well known that the incidence of almost any disease including a "chill" may precipitate a malarial attack. Many theories could be advanced to explain this problem, but it would be more to the point to try to find some explanation applicable to all cases. It seems reasonable to suggest that the circulatory changes, induced by all these different disturbing agents, may be the most potent factor causing the liberation and multiplication of the parasites. Dr. T. R. Elliot has shown that collapse, however produced, rapidly causes the suprarenals to discharge their chromaffin bodies in the attempt to supply the pressor substances necessary for the maintenance of a good circulation. A diminution in the supply of these pressor bodies allows changes in the circulation which possibly favour the activity of the malaria parasites. The popular expression "that the patient is run down" means much the same thing, and so does the scientific expression "diminished vitality."

It has been suggested that trauma liberates some ferment which stimulates the malaria parasites.

It might also be suggested that the lipoids, which may help to keep the parasites under control, are dissolved by the anæsthetic; but these two suggestions would not be applicable to attacks following on mental worry or shock in the absence of an anæsthetic.

However interesting these theoretical considerations may be to the pathologist, I think that the surgeon will be more interested in knowing the practical fact "that a temperature of 102-104 coming on a few days after a carefully conducted laparotomy or arthrotomy in a malarial subject is more likely to be due to the malaria parasite than to sepsis." After encountering a few cases of this description the operator will carefully ask each patient before operating on him if he is a malarial subject, and if so, he will put him on quinine for 3 to 4 days before the operation and continue giving it for about 10

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CHART I.

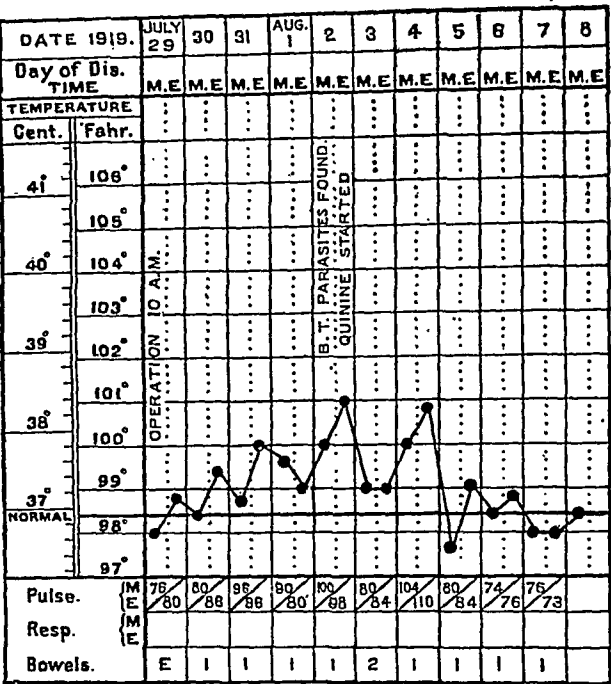


CHART II.

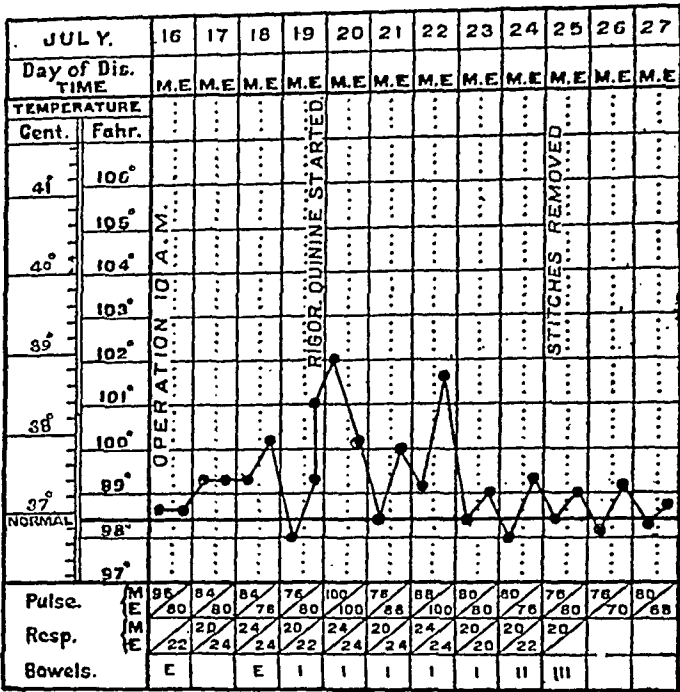
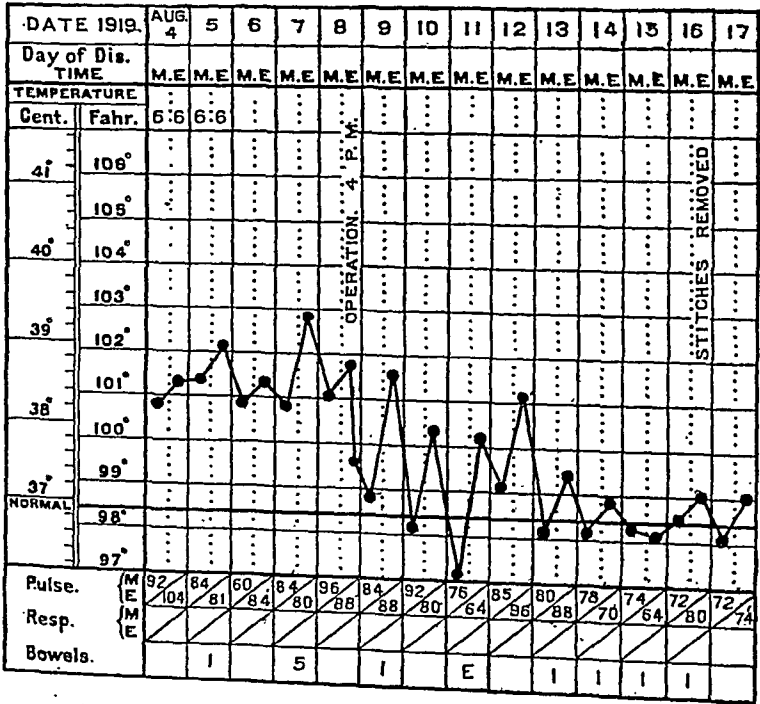


CHART III.



days. By doing this he will obviate all rises of temperature due to the malaria parasite.

There is another condition due to the malaria parasite which is of considerable importance to the operating surgeon, *viz.*, the condition termed "abdominal malaria." During an attack the patient has a rise of temperature, and symptoms and signs suggestive of acute peritonitis. I have seen it mistaken for cholera during an epidemic of the latter disease, but the finding of the parasite in the blood and the absence of the vibrio from the excreta established the correct diagnosis. I have myself opened an abdomen for what I considered to be acute peritonitis, secondary to appendicitis. The condition found inside the abdomen was unlike anything I had seen before. The intestines were slightly injected and appeared to have been painted over with a thin layer of milk. Here and there I came across very small collections of the same sort of fluid lying between coils of intestines. I removed the appendix, but found it practically normal. The appearance of the temperature chart next day, together with a history of a previous attack of malaria, suggested the correct diagnosis and the parasites were found in the blood.

I have also seen a colleague open an abdomen for what he considered to be a perforation of some part of the intestine. The condition found inside the abdomen was exactly the same as I found in the supposed appendicitis case mentioned above, and the subsequent discovery of the parasite in the blood rendered the diagnosis clear.

There is another condition which simulates to some extent a perforation of the intestine, namely, an acute dysenteric abscess of the liver presenting in the epigastric region. This type of hepatic abscess develops very rapidly and within 24-48 hours of the appearance of symptoms a large swelling is formed in the epigastric region. A localised collection from a gastric ulcer which has slowly perforated presents very much the same symptoms and physical signs, and the exact diagnosis is often impossible to establish before a laparotomy has been carried out. An X-ray examination before operation might demonstrate the collection to be entirely within the limits of the liver shadow, and so strengthen the evidence in favour of a liver abscess; but one must remember that the same appearance would be presented by a collection lying under the liver, but covered over by an overlapping anterior liver margin. Putting in an exploring needle is not justifiable in such cases unless followed by an immediate laparotomy.

As a laparotomy is the correct treatment for either condition, there is no advantage in first exploring with a needle. Another peculiarity of these epigastric liver abscesses and one which is rather disconcerting when present, is the fact that they may show pulsation, which at times appears to be expansile. I recently operated on one the size of a tangerine orange in the anterior margin of the liver in a man 42 years of age. It was adherent to the anterior abdominal wall and felt like an aneurism of the abdominal aorta.

The appearance of the temperature chart and the absence of all murmurs decided the diagnosis and this was confirmed at the operation. (Chart 3.)

There is one other subject of practical importance I should like to touch on, *viz.*, the subject of mechanical appliances. When recommending these in preference to an operation the surgeon must take into consideration the discomfort caused by any appliance in a tropical country. A truss or belt for a rupture may be easily tolerated in a cool climate; but in a hot climate the skin soon shows signs of irritation at all points of pressure, and marching becomes an impossibility. Apart from the diminished efficiency of the man with a truss the above consideration should influence the surgeon to advise an operation in every case, unless contra-indicated by some systemic disease.

In conclusion I wish to thank Major Gibson, R.A.M.C., Officer Commanding, British Station Hospital, Kasauli, for permission to publish this article.

FURTHER OBSERVATIONS ON TETANUS.

By A. J. NORONHA, M.D.,

Hon. Physician, J. J. Hospital, Bombay.

(Being a paper read before the Bombay Branch of the British Medical Association on June 26th, 1919.)*

IN a paper of mine published in the March number of the *Indian Medical Gazette*, sent in for publication in November, 1918, I had promised some statistical matter not included therein. The purpose of the present paper is to fulfil this promise with a few additions.

Those who have had medical charge of even a limited number of tetanus cases will know how difficult it is to compare two cases of this disease unless the salient features are very marked, and how open to fallacy are the conclusions that one is often inclined to draw from such a comparative study. As already stated elsewhere, the clinical picture in this disease undergoes so sudden a change that one has to be very careful in recording an average case as "a promising case." I further realise that one or two hundred cases afford a meagre field of study for statistical purposes.

The question as to whether anti-tetanic serum has any value as a *curative agent* in tetanus is one that I believe to be still in the crucible in spite of the experience that has been gained in the great European War. The reason why so many cases have given us so little in the way of reliable information would seem to be principally the more general utilization of prophylactic injections, a practice that has possibly modified the course of the disease and made it more amenable to treatment. The high mortality of 78.2 per cent. in Bruce's first report, as compared with

* A few modifications have been introduced.

19 per cent. of his later report published at the end of 1917, of which at least 73 per cent. were treated with prophylactic injections, shows well the difference that one has duly to appreciate as well as the various factors that must be weighed in drawing conclusions. One can, therefore, realise that great reservation has to accompany any inference derived from facts noticed in connection with this disease. As regards cases occurring in the J. J. Hospital we have one chief advantage, and that is that practically none of these cases receive prophylactic injections previous to their admission, although I understand prophylaxis is now being more generally resorted to. This latter fact may on the grounds of anaphylaxis prove a serious objection to treatment by intravenous injections in the near future, as I am inclined to believe that tetanus is on the increase in Bombay.

Turning to the series of cases under consideration I shall divide these in two groups: (a) Those treated between November 1st, 1917, and October 31st, 1918; and (b) those from November 1st, 1918, to May 15th, 1919. In the second group I left two cases practically convalescent, in fact, one cured. These two cases are included in my series. I have also included in this second group the cases treated during my absence on 15 days' leave, as I found that they would, if at all, tend to give a more favourable colour to my statistics under consideration. This division of the total cases of tetanus into two groups has been found necessary as serum became so scarce that most cases in the second group had to be treated without it. In order to be able to judge how far serum was responsible for the reduction in the hospital mortality, I left intact the other items of the method followed in the treatment, although there was the temptation to raise the dosage of drugs in the prescription used.

The following table will show the rise of mortality in cases treated without serum as compared to my previous figures, which are also appended in a detailed form. The latter results do not quite agree with many others that I have consulted. It does not seem reasonable, however, to assume that both the fall of mortality recorded under serum-therapy and a rise in cases treated otherwise are a matter of chance. There are many authorities who believe in the efficacy of serum treatment, a view that was gaining upon me after working three months in the tetanus wards. This view I expressed with due caution in my previous communications. Cummins and Gibson, in their last analysis published in *The Lancet*, March 1st, comment thus:—

"Our analysis of the tetanus case-sheets at our disposal cannot be said to give any clear indications as to the value of anti-toxin treatment in tetanus. A steady fall in case mortality has, undoubtedly taken place. Where, however, so many factors may have played a part, the greatest caution should be exercised in attempting to draw general conclusions as to how this

improvement has been brought about. It must be admitted that the employment of anti-toxin has up to the present failed to produce such a striking improvement as to be at once apparent in statistical records. On the other hand the dosage has been small. On theoretical grounds we are inclined to the opinion that the dosage has not been large enough."

I have interpolated this extract, which, by the way, I read after I prepared this paper, in order to show that a tendency to believe in the anti-toxin treatment is gaining ground.

TABLE I.

Group 1.

Total admissions from November 1st, 1917, to October 31st, 1918	..	..	66
Died before I saw them	..	..	11
Treated with serum	..	..	51
Died	..	..	33
			Per cent.
Total mortality	..	..	50

This includes two cases that recovered from tetanus and died from intercurrent affections.

Serum cases .. 51.

* Method	Number	Recovered	Died	Mortality Per cent.
V	25	18	7	28
S	7	3	4	57.5
V S	16	11	5	31.25
V T	1	1	0	0
M	2	0	2	100
Total	51	33	18	

{ V=Intravenous.
 { S=Subcutaneous.
 * { V S=Intravenous and subcutaneous.
 { V T=Intravenous and intrathecal.
 { M=Intramuscular.

TABLE II.

Group 2.

Total admission from November 1st, 1918, to May 15th, 1919	..	..	50
Died before I could see them	..	..	9
Serum cases	..	..	20
Treated with carbolic acid (1 recovery)	..	..	21
Received partial serum treatment (all fatal)	..	..	3
Treated as usual until death or recovery	..	..	17
			Per cent.
Mortality in serum cases treated as usual	..	..	29.6
Mortality in all cases that received serum	..	..	40
Total mortality	..	..	74

In the seventeen cases treated in the usual way the subjoined tabular statement may prove interesting:—

Method	Number	Recovered	Died	Mortality Per cent.
V	2	1	1	50
S	2	0	2	100
V S	13	11	2	23
Total	17	12	5	

Comparison of this table with a similar one of group 1 shows well the danger of small statistics in choosing the best method for injection. Intending to bring up the various numbers to one figure I adopted the V S method very largely. The first dose was intravenous and consisted of 9,000 units, and a second dose

of 3,000 units was injected subcutaneously along the nerve that was the probable carrier of the toxin to the C. N. S. Alternate intravenous and subcutaneous doses were given. Sometimes when no vein was available the question was not one of choice. The first intravenous dose had for its object the immediate neutralization of the existing toxin in the blood. This method, I thought, might improve the results, as at least in theory it would give the toxin a smaller chance of ascent by the nerve, while the anti-toxin itself would get into the blood current. This seems to have improved matters, but, as already stated, one has to swell the statistics before drawing inferences. The impression I have gained is, however, that neutralization of the toxin in the blood is essential. One has to live and learn by greater experience as to what constitutes the best method of administering anti-toxin. The idea is now gaining ground that the main distributor of the toxin is the blood from which the motor nerves pick it up for transmission to the C. N. S. This view I had expressed on clinical grounds, and after consulting various sources to secure experimental evidence, in both my papers. Towards the end of last year a thesis has been submitted in Paris defending this hypothesis. The author further contends that nerve conduction results in the production of *local tetanus*.*

As regards the occurrence of anaphylaxis, this is of rare occurrence in the J. J. Hospital. I have had but one case that presented symptoms suggestive of it. This patient had suffered from plague many years ago, and probably had been treated with anti-pest serum at the Mahratta Plague Hospital, where it has been discarded since many years.

Carbolic acid without serum has proved most disappointing. Out of 21 cases in which it was used, only one recovered. With the second group of serum cases it has been used in almost all the patients but I have no accurate record to be able to compare notes with those cases treated with serum alone. A larger quantity of the drug may be more effective, but as untoward results have to be carefully watched, and as I would not undertake the risk of such an occurrence during my absence from the hospital, I thought it best to limit myself to three or four injections of a 2 per cent. solution, one or two ounces at a time. I have, however, noticed an improvement in the spasms in many cases in which it was used, and the patient's exhaustion was thus lessened. This is certainly an advantage which I should be sorry to sacrifice.

I shall now return to the question of "trismus."† Although the number of cases studied in this connection is much smaller, I believe I

can look upon the figures with greater confidence. As the variability of this symptom is an outstanding feature of the disease, it seemed to me possible that "trismus" might be of some prognostic significance. This was also partly suggested by the classification advised by the tetanus committee. I began collecting evidence in order to test this point, sometime about the middle of May, 1918, and in order to eliminate some objections I took up only those cases that received the complete treatment as I was giving it. Cases where no serum or the usual full doses of the same could not be given, as also those where observations seemed to me incomplete or not above suspicion, were discarded.

To these one may conveniently add the three cases without any trismus that came to my notice. All of these recovered.

TABLE III.

Number of cases studied . . . 36.				
	No. Recovered.	Died	Mortality	
			Per cent.	
1. Complete trismus on admission ..	20	9	11	55
2. Incomplete trismus on admission ..	11	8	3	27.3
3. Complete trismus with wounds on head or face—				
(a) With facial paralysis ..	4	3	1	25
(b) Without facial paralysis ..	1	1	0	0
Total ..	36	21	15	

With reference to the four cases with facial paralysis, these are rare instances. The paralysis may be the result of a block anywhere in the course of the facial nerve. If the block is in the petrous portion of the temporal bone, involving the nerves of the ossicles and the chorda tympani, hearing, smell and taste are all affected. More commonly it assumes the usual peripheral form such as that seen in Bell's palsy. Only one or both the divisions of the facial nerve may be involved, without observing any rules of proximity to the wound. By this I mean that if the wound is nearer to the temporo-facial division, the cervico-facial may be affected, producing an inferior facial paralysis. This is well illustrated in one of the photographs on page 458. In one of the cases the wound was in the parieto-occipital region, but in every case on the same side as the paralysis. In one case one has to eliminate direct traumatic lesion of the facial nerve, but both the divisions of the facial were affected, the upper one less so than the lower. The eye could be only partly closed. The wound was nearer the eye.

In my first paper I dealt more or less fully with the facts that led me to suggest that the brain may under certain conditions be affected. Expert experience seems to be entirely against this suggestion. Dr. F. W. Mott, in a letter to Sir David Bruce to whom I referred the question, says that in all his 25 years' experience in the London County Asylums he has not come across

* *Lancet*, 28th December, 1919.

† N.B.—From these statistics and on theoretical grounds (*vide* my paper in the March number of the *I. M. G.*), I am inclined to believe that trismus loses its prognostic significance when the wound is on the face or head, i.e., in a site under the sphere of influence of the trigeminal nerve.

a single case, although it must be borne in mind that a potentially insane person may show signs of insanity under the influence of tetanus toxin. Similarly an insane person may get tetanus. Sir David Bruce himself has not seen any such case in his war experience. On the face of this, one feels some diffidence in discussing this point. Still I here record the following cases and data without comment :—

1. A case in the practice of Dr. M. A. de Heredia, practising in this city, in which insanity was observed during convalescence. She remained so for 17 years and died in a state of dementia. There is absolutely no family history of insanity and as far as is known she was not of a neurotic temperament.

2. A case which I treated in consultation with Dr. M. Fernandes, L.M. & S. She remained insane for one month after recovery from tetanus and eventually completely recovered.

P. M. feature of some cases of tetanus. He also mentions delirium as one of the symptoms (*vide* Allbutt's System of Medicine, 2nd edition).

7. Frazier in Keen's Surgery mentions a "psychical tetanus" produced in animals by Roux and Borrel by injecting tetanus toxin into the brain (cerebral tetanus).

8. Toxin gets into the blood of tetanus patients which constitutes the means of mediate distribution in the body to the various motor nerves. It must certainly then circulate also in the brain, although selective action has to be considered. Wassermann and Takaki showed that, *in vitro*, brain substance has a strong affinity for the tetanus toxin, so that emulsion of brain substance has been advocated in the treatment of the tetanus.

In conclusion, I may briefly recapitulate the view that I on former occasions discussed at length, *viz.*, that serum to be of value has to be



She was inclined to be neurotic. No family history of insanity.

3. A strong and otherwise healthy case admitted in this hospital with a fixed idea that no water or food was being given him. Suspecting neglect I gave him with my own hands nearly a pint of water. Five minutes later I was found included among his torturers. He was in other respects perfectly sane. He recovered completely and had no idea as to what he had said.

4. A post-mortem examination of a tetanus case in which we found oedema of the frontal convolutions, flabbiness of the brain substance as a whole, and an increase of the C. S. fluid.

5. Dr. D. Judah, M.D. (Lond.), happened once to mention to me a case that he had come across in the Lady Hardinge War Hospital, which case was also seen (so far as I remember Dr. Judah's statement) by Col. Glen Liston. A lumbar puncture caused the C. S. fluid to spurt at a very high pressure.

6. Prof. Sims Woodhead mentions oedema of the brain and increase of the C. S. fluid as a

used early in large doses, and with simultaneous cleansing of the seat of tetanigenous inoculation. One has to bear in mind that one is dealing with an anti-toxic serum, which can only neutralize the toxin without killing the germs and these latter must be eliminated to the best of our ability without breaking the protective barriers established by Nature. A combination of a *bactericidal* and an *anti-toxic* serum may improve the chances of recovery in the victims of this disease. The suggestion of bactericidal serum was put forward in France by Dr. Tabakian (*Nouvelle Orientation du Traitement curatif du Tetanos*; A. Maloine et Fils, Paris 1916). So far as I know all his data have not been accepted as decisive. Still the suggestion is worth considering.

REFERENCES.

- (a) Some Remarks on Tetanus—Paper read before the B.M.A. (Bombay Branch) July 25th, 1918.
- (b) Tetanus—*Indian Medical Gazette*, March 1919.
- (c) Tetanus with Facial Paralysis—*Indian Medical Gazette*, May 1919.

GENERALISED VACCINIA IN BURMA.

By S. RAMA IYER, L. M. & S.,

Madras.

IN the course of verification of vaccination done in Thaton District, I came across for the first time, on the 12th November, 1917, a recently vaccinated child, about 3 years old, in a village called Kawtin, with scabbed-over eruptions and depressed raw areas which seemed to terminate in depressed scars on its body. As there was a clear history of the child not having been previously exposed to the infection of small-pox or chicken-pox, and none of the 85 children vaccinated with the same lymph as this child had developed similar eruptions, it roused my curiosity to know if it had anything to do with the lymph used. I therefore referred the matter to the Director, Vaccine Dépôt, Meiktila. Colonel Entrican, I.M.S., the Director of the Dépôt, very kindly drew my attention to an article on *Generalised Vaccinia in Sudan Natives*, which had been published in the *Journal of Tropical Medicine and Hygiene* on October 15, 1917, and suggested that mine was possibly a case of generalised vaccinia.

I have since come across two more cases, one of them being a fairly severe one, though of discrete variety. I have given below notes of those cases. There has since been (till 12-8-19) no occurrence of small-pox, chicken-pox or vaccinia in any of the villages where the vaccinia cases were noticed.

It will be seen from the notes of the cases that vaccinia seems to depend on personal idiosyncrasy and not on climate, race, lymph, or the tube in which it is contained. Although it took 12 to 22 days for generalised vaccinia to appear in the cases reported by Dr. Chalmers and Capt. Archibald, my cases show that the incubation period can be as short as five days, and that it does not seem to be infectious in the sense in which small-pox and chicken-pox are.

I am sure that other medical officers in Burma and India have seen such cases; but they do not seem to have given publicity to their experience. Further, the literature on "Generalised Vaccinia" is very meagre. I have, therefore, deemed it fitting to publish my notes to stimulate interest in the subject.

Case No. 1.—

Tun Shwe, three years old, son of Hninyon and Kalagyi, of Kawtin village, Kyaukto Township, was vaccinated on 10th November, 1917, with lymph No. 208, prepared at Vaccine Dépôt, Meiktila and was verified by me on the 12th November, 1917. At the time of verification, scabs and depressed, but not deep, raw areas were visible all over the body, including the

palms, soles and the head. Those in the soles had more or less the feel of small-shot. Two successful scars, the result of recent vaccination, were visible on the left upper arm. It was said that the child had been vaccinated in the preceding year without effect.

History of eruptions.—The father of the child, who appeared to be rather dull, said that the child had fever for two days after vaccination, and on the 3rd day developed eruptions. Ten days later, clear fluid, which in three days became converted into pus, appeared in some of them and in the others only pus without the intervention of clear fluid. The child had not previously been exposed to infection of small-pox or chicken-pox. None of the 85 children vaccinated with the same lymph developed similar eruptions and there was nothing peculiar about the tube, the lymph from which was used to vaccinate the child.

The father and mother had both been inoculated against small-pox in their tenth year.

Case No. II.—

Ma Kyi, about three and a half years old, daughter of Maung Chit Tun and Ma The, residents of Hninpale, Thaton District, was vaccinated on 9th February, 1919 with lymph No. 370, despatched from Meiktila on 6th February, 1919, and was seen by me on 6th March, 1919. It was found that she had two successful marks of recent vaccination on her left upper arm. All over the body, there were little, depressed, raw areas which were sure to end in depressed but not deep scars, and also scabbed-over pustules. The extensor surfaces of the forearms were more involved than the flexors. A few pustules which had a waxy and umbilicated appearance were also noticed. They did not collapse when pricked with a pin. A few dried-up eruptions on the soles and palms had a hard feel about them. The eruptions were discrete. No other child among the recently vaccinated and the unvaccinated had developed similar eruptions.

History of eruptions.—Two days after vaccination the child got fever and it lasted for three days prior to the appearance of a rash all over the body. Clear fluid appeared in the eruptions two or three days after their appearance. About three days later the vesicles became converted into pustules. Five days after the formation of pus, they began to dry up and scab over. The eruptions came out in different crops. The child was not put to bed though the mother said that her body was hot throughout the course of the disease. There had occurred neither small-pox nor chicken-pox in this village or its neighbourhood prior to the vaccination of the child on 9th February, 1919.

There was no history of the child or its parents having previously been exposed to the infection of small-pox or chicken-pox.

The father had two successful marks of vaccination on each arm and the mother had two marks on one of the arms.

Till the end of July, there occurred in the village neither cases of chicken-pox, nor small-pox, nor vaccinia, although there were many unprotected children in the village, including the patient's own sister, about a year old, living in the same house.

Case No. III.—

Ma Saw, aged two and three-quarter years, daughter of Ko Tun and Ma Nu, Taungthus, living in Kathapha village, Thanton Township, was vaccinated on 19th June, 1919, with lymph No. 57 despatched from Meiktila on 13th June, 1919, and was seen by me on 25th July, 1919.

The child had two successful marks of recent vaccination on the left upper arm. Numerous depressed scars were also visible on the face, abdomen, back and the upper and lower limbs; the extensor surfaces of the forearms were more involved than the flexors. None were found on the soles and palms.

The mother had one big successful vaccination mark on the right upper arm. The father had two successful marks on one of the arms. The child's grandmother on the father's side was said to have had small-pox; particulars about other grandparents could not be had. There was no chicken-pox or small-pox in the village for several years prior to the development of eruptions by this child; nor was there any history of the child having previously been exposed to infection of small-pox or chicken-pox. None of the other 97 children vaccinated with the same lymph developed similar eruptions.

History of eruptions.—Three days after vaccination, the child got fever. Two days after fever, papules came out. Clear fluid appeared three days later; pus formed two days later. Scabs formed four days after the appearance of pus. The mother was found to be civilised and intelligent, and gave a clear account of the eruptions.

rupture of the scar of an operation on inguinal hernia.

History.—The patient was admitted into the hospital at 8 A.M. of 25th June, 1919, with 4 feet 7 inches of the ileum outside the abdomen. He was a Hindu, male, about 45 years old, a priest by occupation, and was operated on successfully about 6 years ago for strangulated hernia at the Medical College Hospital.

For the previous six months he had observed a small swelling on the scar, which increased steadily, though very slowly, until during the preceding fortnight it became very thin-walled and a little painful. On the day before admission the swelling burst on coughing after his main meal, and the coils came out. He was brought to the hospital as soon as possible (22 hours afterwards).

Examination.—The patient was fairly nourished; the body-pulse could not be felt; respiration 32 per minute, with very rapid heart beat. The patient complained of thirst. The intestine was highly congested throughout its length and was almost black. It was supported by the dirty clothes of the patient.

Treatment.—For shock. The patient was at once put to bed; sterile hot towels were applied to the intestines and the uppermost towel changed frequently; the dirty clothes were carefully removed; a blanket on a cradle was put over the patient with electric bulbs within the cradle, for dry heat; a hot-water bottle was applied to the feet. Within seven minutes the pulse could be felt at the wrist, and the patient became comfortable. Warm milk, about three ounces, was then given. The patient went to sleep.

About half an hour after he suddenly brought up a large quantity of water and lost his pulse at once; the breathing became hurried, and he died within six minutes.

Post mortem.—The scar gave way two inches above the external ring; the wall was very thin, almost like paper; there were no muscles at the roof of the canal; the peritoneum wall had a thickened ring near the opening.

Conclusion.—This shows the importance of absolute rest and support for a considerable time after an operation for radical cure of hernia.

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By GOKULANANDA DE, M.B.,

Resident Surgeon, General Hospital, Howrah.

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Indian Medical Gazette.

DECEMBER.

ANAPHYLAXIS.

SEROLOGY is of yesterday, and it is not matter for wonder that, although heuristic principles have been set to work on the problems offered by serological phenomena, the elucidation of many of these is yet far to seek. Of the making of theories there is no end, until sufficient experimental data have been collected by competent observers for the proof or otherwise of their sure foundation on ascertainable facts. The very striking phenomenon to which Richet first gave the name of anaphylaxis has been viewed from all sides, but we still are not clear as to its causation, though we have accumulated much real knowledge regarding anaphylaxis and anti-anaphylaxis, since the day when Richet and Portier discovered that, although a certain quantity of the extract of *Actinia* tentacles had no effect on a normal dog when injected intravenously, it was able to kill a dog that had received a small dose of the extract some days before; and since the day when Arthus found that rabbits, which had received at several days' intervals subcutaneous injections of horse-serum, always developed infiltration at the site of the fourth injection, which became indurated after the next injection, and necrosed after the next.

That foreign serum is toxic was shown by the series of cases published by v. Pirquet and Schick. These observers found that in children, who for the first time received an injection of antidiphtheritic serum, certain symptoms were noticed after the sixth day, and never before this; whereas the same symptoms were seen within twenty-four hours after the second injection in children, who at some antecedent period had received an injection of serum, even although there had been only a small quantity injected then. Theobald Smith, too, found that those guinea-pigs, that had already received a test injection of antidiphtheritic serum and diphtheria-toxin, showed very alarming symptoms if they received a subsequent injection of horse-serum. Otto showed that the diphtheria-toxin had little, if anything, to do with this sensitisation to horse-serum, which depended on horse-serum alone. He found that guinea-pigs sensitised with antidiphtheritic serum did not react when

the second injection was made with goat-, ox- or rabbit-serum. And he also found the surprising fact that the smaller the first dose the more certain it was to induce sensitisation. Rosenau and Anderson showed that sensitisation requires an incubation-period of ten days, if the dose be small; and that even one-millionth of a cubic centimetre of horse-serum was sufficient to cause in a guinea-pig sensitisation which lasted all its life. Besredka found that the larger the first dose the longer the incubation-period lasts. He surmised that it is only when the foreign serum has become almost entirely transformed within, or eliminated by, the organism that sensitisation occurs.

Otto and also Rosenau and Anderson showed that this sensitisation is specific: guinea-pigs are sensitised only to the substance first injected. If this be horse-serum, then they do not react to the second injection if it be made with egg-white, goat-serum, etc. Besredka showed that while raw egg-white and heated egg-white are both capable of sensitising a guinea-pig, they do so only for themselves: a guinea-pig sensitised with raw egg-white does not react to heated egg-white, and *vice versa*: for the difference between the albumin when raw and when heated is as great as the difference between the albumin of the serum of one species and that of the serum of another species. Nevertheless, a guinea-pig sensitised with hen's egg-white will react to pigeon's egg-white, if the dose thereof be fairly large, although it shows no reaction to a small dose.

Nicolle and many others have shown that the serum of a sensitised animal, when injected into a normal animal of the same or another species, causes passive sensitisation, which is immediate in its action.

Undoubtedly, then, the serum of a sensitised animal contains some substance which is not present in the serum of a normal animal. What this is has been variously answered. Gay and Southard at one time believed that in the foreign serum injected there existed a substance to which they gave the name of *anaphylactin*, and that this remained in the organism after all other constituents of the foreign serum had been eliminated. Richet believed that the sensitised animal manufactures an antibody for the foreign serum, and that, when the second injection is made, this combines with its antigen and forms a poison to which he gave the name of *apotoxin*, the antibody which goes to form it being named *toxogenin*. He believed that whatever be the

protein injected the apotoxins eventually formed are practically identical, and that their study is rendered difficult by the fact that they are rapidly destroyed by the organism, and therefore cannot accumulate in the blood.

Friedberger was of opinion that the sensitising substance induces the formation by the organism of an antibody (precipitin), which at the second injection combines with its antigen and in the presence of complement gives rise to *anaphylotoxin*, which by its toxic action gives rise to the shock, etc. observed. His experimental evidence at first sight seems to be very good. All that one needs for the manufacture *in vitro* of anaphylotoxin are an antigen, its precipitin and complement (fresh serum). The antigen and precipitin when mixed give rise to a precipitate. This is well washed and then incubated with fresh serum. The tube contents are then centrifugalised, and the supernatant fluid, when injected *intravenously* into a guinea-pig, causes the classic train of symptoms. If, instead of fresh serum, serum that has lost its complement by being heated to 56 degrees C. for half an hour be used, no anaphylotoxin is formed. Q.E.D. Further, Friedberger and his pupils have shown that bacteria give rise to anaphylotoxin in the same manner, and they believe that the symptoms of infectious diseases are due not to the endotoxins of the various bacteria that are found present, but to the anaphylotoxins to which these bacteria give rise. They believe that fever is but "*anaphylaxis e refracta dosi*."

Besredka has pointed out that *subdural* injection of "anaphylotoxin" produces no effect and that, if the precipitate formed by the union of antigen and precipitin be heated to 100 degrees C., it is still capable of forming anaphylotoxin when incubated with complement, although manifestly the product in such a case is not one that could possibly be formed in the living organism. Further, if so very innocuous a bacterium as *B. prodigiosus* be incubated with complement, without any antibody to it being present, a high-power anaphylotoxin is produced. And, as Keysser and Wassermann showed, complement itself, if acted on by so inert a substance as kaolin, produces anaphylotoxin, without antigen or antibody being present. Nor is complement at all necessary, for Doerr and Russ showed that antigen and antibody without it can give rise to anaphylotoxin. Again "vaccination" with small doses of egg-white protects against egg-white but not against an injection of the anaphylotoxin made from egg-white, so there

must be a flaw somewhere in Friedberger's reasoning.

Vaughan and his collaborators have surmised that the first injection excites the cells of the organism to form a ferment to digest the foreign protein, and that this ferment, when it combines with the protein introduced at the second injection, causes very rapid digestion thereof, setting free a toxic group of molecules, to which the phenomena of anaphylactic shock are due. They have shown that the extract of the organs of a sensitised guinea-pig, when brought into contact with egg-white or horse-serum, produces a substance which, when injected into a normal guinea-pig, give rise to the classic train of symptoms. This ferment can pass through a Berkefeld filter; it is inactivated on being heated to 56 degrees C. for half an hour, and may be reactivated by the addition of fresh organ-extract.

Kraus and Biedl believed that the phenomena are due to the presence in the circulation of a substance which is physiologically identical with Witte's peptone. They found that peptone injections vaccinated a dog sensitised with serum, so that it did not show the usual symptoms of anaphylaxis when it received the second injection. But peptone does *not* vaccinate guinea-pigs against the serum to which they have already been sensitised.

Besredka believes that in the serum injected at the first injection there exists a substance which he calls *sensibiligen*. This resists heat, and excites the organism to produce *sensibilisin* which combines rapidly with the sensibiligen of the second injection, and "the effect of their affinity is to produce an intense reaction." The symptoms of anaphylaxis depend on the *rapidity* of their combination, and its *site*—probably the nervous system, since intra-vascular and subdural injections have most marked results, while subcutaneous injection has least effect, because it can only give rise to very slow absorption of sensibiligen.

As horse-serum is at present the vehicle of anti-toxic injections, and as the human subject may suffer much when sensitised to horse-serum, the problems of how to lessen the poisonous characters of the serum, and how to increase the resisting power of the organism arose very early in the study of anaphylaxis. Besredka carried out a series of experiments on these points. If an antidiphtheritic serum be heated to 59 degrees C. and no higher, for an hour on three consecutive days and for two hours on the fourth day, it becomes only one-third as toxic as if it

were unheated, as may be seen when it is injected into a sensitised guinea-pig. It is to the systematic heating of antisera which obtains in France that he attributes the freedom from serum-accidents when French antisera are used.

He found that ether-narcosis absolutely protects a sensitised guinea-pig from the effects of a lethal dose of serum given subdurally. Also that if such a guinea-pig be rendered unconscious by means of alcohol, it is protected against a lethal dose, and this protected condition lasts for twenty-four hours.

Morphine and opium have, however, no such protective action. These were important discoveries, but they are as naught compared with his discovery that by means of small doses it is possible to "vaccinate" a sensitised animal, so that it can tolerate a dose even a thousand times greater than what would otherwise be a lethal dose of the substance.

In his work "Anaphylaxis and Anti-anaphylaxis," of which an English translation has recently appeared, Besredka, after describing the intravenous method of injection as the most convenient and also the most rapid means of inducing desensitisation (anti-anaphylaxis), writes as follows:—

"We begin by testing this sensitiveness by introducing intravenously as weak a dose as is desired—0, 1 c.c. of serum, for example. (The serum is diluted to ten times its volume with physiological saline solution, and 1 c.c. of this dilution is injected.) If the patient does not react at the end of three to five minutes, another injection of 0, 3 c.c. of serum is given (3 c.c. of the dilution) without withdrawing the cannula. We again wait two minutes, and if nothing happens we inject 1 c.c. of serum (10 c.c. of dilution)." (p. 73).

"To be certain that anti-anaphylactic immunity is acquired it is necessary to proceed to the dose which we term 'precritical,' the effect of which is shewn in man by the onset of anxiety and a redness of the face lasting some minutes. It is a sure indication, and from this point of time onwards the patient is desensitised, and is in a position to tolerate with impunity as much serum as it is desired to administer.

The precritical dose may be varied in different subjects according to the degree of hypersensitiveness manifested by the particular individual. The principle is that we should act in practice as if we were always dealing with individuals who are most hypersensitive, and, commencing

with weak doses, as above indicated, proceed rapidly without stopping if we see the patient does not react to them and go on injecting stronger and stronger doses till the precritical dose is attained" (p. 77).

He compares anaphylaxis and anti-anaphylaxis to the phenomena observable, when a flask of strong sulphuric acid has water added to its contents. If the addition be very gradual nothing untoward happens, the acid becoming gradually weakened; but if the addition be sudden and in large amount an intense reaction takes place and the flask is shattered.

Anaphylactic shock itself brings about the desensitisation of the animal, but is too violent to be a safe means of doing so. Probably when the method of concentrating antisera, which Miss A. Homer has devised, has come into universal use, serum-accidents will be rarer, owing to the abstraction of the serum-albumin by the process of concentration. However this may be, it is well for all practitioners to read, mark, and thoroughly digest Besredka's work.*

W. D. S.

Current Topics.

St. John's Ambulance Association.

Proceedings of the Annual General Meeting held in the Council Chamber, Viceregal Lodge, Simla, on the 24th of June, 1918, at 6 p.m.

His Excellency the Commander-in-Chief said:—

In presenting the annual report of the St. John's Ambulance Association for the past year, I am again able to state that our activities have not been adversely affected by the constitution of the Joint War Committee. Although in some respects progress is necessarily slower than it might be in normal times, as illustrated, for example, by a regrettable drop from Rs. 24,039 to Rs. 19,241 in the donations received during the year, we may claim that the interest in the Association's work has continued to expand rather than contract. There has been an increase of 15 in the number of provincial and other centres. The membership, the increase of which from 3,000 to 7,500 was a subject for congratulation last year, has continued to increase and now reaches a total of nearly ten thousand; and our courses of instruction have continued to

* Anaphylaxis and Anti-anaphylaxis, by Dr. A. Besredka.

English edition by S. Roodhouse Gloyne, M.D., London 1919.

W. Heinemann (Medical Books), Ltd., price 6 s. nett.

develop satisfactorily. On the civil side again, ambulance work among the police forces continues to be specially satisfactory. In most provinces, the award of the Association's certificate has progressed, but not perhaps in all provinces to the extent we might have hoped. In Bengal, for example, as will be observed from the report, there have been no awards of the certificate to the Bengal police, though many have been earned, and this is a subject upon which correspondence is proceeding with the Bengal authorities. I should like also to state, though this is only cursorily mentioned in the report, that at the instigation of the Bombay Presidency centre, the question of reorganizing and readjusting the financial relations between local and provincial centres on the one hand and headquarters on the other, has been taken in hand; and, on receipt of replies from other provincial centres, we shall probably have to consider what may be a reorganization of considerable importance. This is referred to in the paragraph relating to finances, where allusion is made to the possibility of sacrificing a proportion of our financial resources. It is true that the modified scheme proposed involves a change in the percentage of subscriptions retained at headquarters and local centres, but I have reason to hope that, as a result of this change, there may develop a spirit of greater activity on the part of provincial and local centres which will more than recoup any loss due to a diminution in the proportion of the receipts retained at headquarters.

Touching the war side of our activities, I should like to observe that the Army have reason to be grateful for the Red Cross work undertaken at the instance of the Joint War Committee in connection with the Waziristan Expedition and with the operations in the Marri Country.

340 Nurses and 577 Nursing Orderlies have been recruited by the Association during the year and are employed principally in the War Hospitals in India as far as the nurses are concerned, and in Bombay and Mesopotamia in the case of the orderlies.

It will be observed on pages 4 to 9 of the report that Military Officers are substantially represented on the Honorary Medical Staff, and voluntarily give their services in the important work of lecturing and examination of classes.

Last year I referred to the developments, which, I hoped, would take place on the military side in reference to voluntary nursing and canteen work, and I will briefly explain what has been done under these heads.

Communications were sent to Governors, Lieutenant-Governors, and other heads of Civil Administration as well as to Army and Divisional Commanders, asking them to assist in the promotion of a scheme for utilizing the voluntary services of lady visitors in Military Hospitals. The replies received were in every case most satisfactory, the idea was eagerly taken up, and I have to thank the various high officials for their hearty co-operation, and the ladies for the

enthusiastic manner in which they came forward—often at considerable inconvenience—and helped to brighten the lot and raise the standard of comfort of our sick soldiers.

I trust that in the coming year the kindly services of all these volunteers will continue to be available for this good work.

It was suggested in last year's report that there was great scope for voluntary effort in adding to the comfort of soldiers when travelling, and that much might be done in the way of organizing well-cooked meals at the larger railway stations.

We are now all conversant with the success which attended this movement, and what a boon the canteens established at many railway stations have been to the soldiers.

The Army owes a debt of deep gratitude to Her Excellency and to the ladies who have worked with such devotion and competence to promote the comfort of the soldiers.

In conclusion, I have again to thank Mr. Hanrahan, the General Secretary, who has continued to work with his usual assiduity during the past year.

Your Excellencies, I beg to present the annual report.

The Hon'ble Sir Claude Hill, as Chairman of the Joint War Committee, said:—

Your Excellencies, Ladies and Gentlemen,—I think you will wish me in the first place to give expression, on behalf of all of us, to the deep sorrow and regret we all feel for the fact that Surgeon-General Sir Pardey Lukis, who has for so long so ably represented the work of the Red Cross and the Order of St. John of Jerusalem, has been taken from us. The Joint War Committee have separately recorded their sense of the great loss which the cause has sustained in Sir Pardey Lukis's lamented death last year and all of us here keenly appreciate how very largely the inordinately heavy work, which he so cheerfully undertook in addition to his own overwhelming labours, in connection with the Joint War Committee operations, contributed to his fatal illness. No one man has ever toiled more assiduously or more devotedly for any cause than did Surgeon-General Sir Pardey Lukis on behalf of the great movements represented to-day by the Joint War Committee.

When Sir Pardey Lukis addressed this meeting at this time last year the demands from Mesopotamia were beginning to increase rapidly and financial difficulties loomed on the horizon. The Home Committee had generously come to our aid and arrangements had been made by which a Mesopotamia Sub-Committee, constituted at Bombay, was to supervise the Basra stores indents. Towards October last, it became apparent that the expenditure was rapidly outstripping our revenues and Your Excellency, with the concurrence of Sir Pardey Lukis, decided to make an appeal to India for the support of the Red Cross cause, thus falling into line with what had been done at home and in other parts of the Empire.

The results of the effort, which culminated on the 12th of December last, have been already made public, but, I think, I am justified on this occasion in once more placing on record the deep sense of obligation under which the Joint War Committee feels it has been laid by all those who, at the instigation and under the presidency of Her Excellency Lady Chelmsford, did so much to produce such wonderful results. The aggregate amount collected in India in connection with "Our Day" was Rs. 1.22 lakhs. Where practically every province in India contributed more largely than could have been hoped for, it would be invidious to draw special attention to the results in any one part of India; but perhaps I may be pardoned for expressing pride in the fact that, although hotly pursued by two or three other provinces, my own Presidency—Bombay—headed the list with their total of nearly Rs. 21 lakhs. This result, so nearly surpassed, as I have said, by other provinces, was, of course, due to the wonderful manner in which Their Excellencies Lord and Lady Willingdon, in spite of their manifold other activities, found time to organize the arrangements for "Our Day." In the Punjab—thanks to the splendid efforts of Lady O'Dwyer—the results were even more surprising, while the United Provinces and Bengal all contributed in the most splendid possible manner. In organizing "Our Day" Your Excellencies wisely intimated to the heads of all provinces that they were at liberty to devote the proceeds of their effort to any extent that might be found necessary to provincial war needs, but you also indicated the sore straits in which the Joint War Committee found themselves financially, and expressed the hope that, so far as was compatible with supplying provincial needs, they would come to the assistance of the central organization. I am glad to be able to state that practically every province in India has responded most generously to that appeal, and that the Joint War Committee are now in a position, we hope, to be able to finance all the demands overseas which may be made upon us for a very considerable period to come.

This condition of affairs is most satisfactory, as compared with that with which the Joint War Committee were confronted last autumn; and it is due, not only to the splendid response which has been made to the "Our Day" appeal, and to the continuance of those donations from all sources which have so greatly helped us in the past, but also to two other factors to which I ought to refer. The first is that it has now been arranged that some of the services, which were previously performed by the Red Cross, shall be discharged by the Government. Such services are the maintenance of hospital ships which had been previously supported by private subscription, the provision of all those hospital supplies, formerly contributed by the Red Cross Agency, which can be classified as being hospital necessities, and sundry other supplies chiefly connected with transport. The assumption of responsibility for these supplies by Government

has resulted in a considerable simplification of our Red Cross indent forms and a material reduction in our expenditure and I should like to take this opportunity of acknowledging gratefully the ready manner in which His Excellency the Commander-in-Chief and the Director of Medical Services have met the Red Cross in this matter.

The second factor which has contributed to ease the situation is the introduction of a scheme of reorganization, which was rendered possible by the altered financial situation brought about by the response to the "Our Day" appeal. It was felt—as soon as it was legitimate to hope that that appeal would result in placing the provincial centres on the one hand and the Joint War Committee on the other in a situation of financial stability—that the time had come to introduce reforms tending towards decentralization on the one hand and co-ordination of effort on the other. On the side of decentralization, the scheme contemplated the regular organization of provincial centres in every province to be in direct touch with the Joint War Committee at headquarters; coupled with, where necessary and desirable, the establishment of provincial depôts under the control of provincial centres. With a view to closer co-ordination, the provincial centres were to be the provincial branches of the Joint War Committee and to be responsible for all hospital convalescent sections and other Red Cross activities within their own areas, and to contribute to the Bombay depôt regular supplies of articles made by their work parties where these existed; provincial branches were also to encourage or collect additional subscriptions of money for the Central Fund to enable the Joint War Committee to concentrate upon expenditure on Red Cross work in Mesopotamia, East Africa and India, and to supplement the funds required for provincial administration where these were deficient.

Provincial depôts have now been established at Cawnpore, for the United Provinces, at Karachi for Sind and at Pindi and Peshawar for mobilization purposes, while at Lahore and Calcutta depôts were established before the re-organization scheme was mooted.

In the case of each hospital, etc., the local work party was, as far as possible, to meet local requirements, while the provincial work parties in the aggregate were to meet all provincial hospital, etc., requirements indenting on the provincial depôt, where these existed, for assistance when necessary, and ultimately on the Bombay Depôt.

The Central Bombay Depôt was to be the receiving depôt for all surplus supplies and articles contributed to work parties over and above those required in the provinces concerned.

Under this scheme, the Bombay Depôt became the receiving station of all the material and supplies not required by provinces as well as all those furnished by independent work parties such as the Simla-Delhi Ladies work party. It became the focus depôt too on which not only

East Africa and Basra were able to indent but also any province suffering from a deficiency of supply of any kind.

The Central Joint War Committee was, under this scheme, to be the repository generally of information from all provinces as to requirements and surplus supplies and was to supplement provincial finances when this was necessary. It was to have the further function of collecting from, and distributing among, provinces detailed information as to requirements or new developments; and under the contemplated organization it should be, and I hope is, to a certain extent, the referee for any information that may be required under any head of activity undertaken by any provincial centre.

The proposals for reorganization on the above basis received the cordial support of practically every provincial centre in India and in the result—though the process of reorganization involved considerable work—the Joint War Committee find that the scheme has tended to secure greater efficiency as well as economy, both of money and of labour. We are greatly indebted for the many suggestions and much valuable advice that has been received from several provinces in respect of the details of the reorganization.

Last year, Sir Pardey Lukis presented an *ad interim* report up to the 31st of January, 1917. The Joint War Committee have decided to discontinue the issue of *ad interim* reports. I therefore to-day only formally present the full report up to the end of the Red Cross financial year, namely, the 31st of July, 1917. The report, up to the end of July of the current year, will be published as early as possible. As the period covered by the report is in many respects ancient history, I trust that I shall not be unduly trespassing upon the patience of this gathering if I supply a few details in respect of the financial position, supplies, services, and so forth, extending over the current year period up till last month.

First in regard to the financial position. On the 1st November, 1917, we were over 3 lakhs overdrawn at the Bank, and the overdraft, by 1st December, amounted to over 8 lakhs. The total collections on account of "Our Day" have been separately published: the share contributed to the Joint War Committee by provinces now reaches the magnificent total of Rs. 83,54,000, or over 20 lakhs better than when (on 2nd February) the half-yearly budget was framed. We now expect, on the basis of actual receipts, and taking into account the savings we confidently hope for, that the credit balance on 31st July, 1919, will approximate to nearly 20 lakhs of rupees after meeting all demands for the current year which can at present be foreseen.

Coming now to material supplies. I may mention that, since August, 1917, until last month, 8 new launches were supplied to the Red Cross Commissioner in Mesopotamia, 2 presented by the people of the Ferozepore District, 2 by the Chhattisgarh Feudatory States through Lady

Robertson, one by the people of Bilaspur through Lady Robertson, one presented by Rani Abhayaeswari Debi through Sir Archdale Earle, one by Raja Rajindra Bhanj Deo of Kanika through Sir Edward Gait and one which was purchased to replace another which had become unserviceable. It may be of interest to know that between the 1st of August, 1917, and the 31st of March last, the Red Cross launches in Mesopotamia ran 162,005 miles.

As regards motor ambulances, five were received, one from St. John's Ambulance Association, Muzaffargarh District, two presented by the people of the Kendrapara Sub-Division in Bengal, one purchased from a donation received from the 24-Parganas District and one received from the Moga Tahsil of the Ferozepore District towards "Our Day." Eight cars are at present under provision, two being purchased from a donation received from the Gujranwala District Red Cross Society, one being an ambulance for the State War Hospital, Datia, four being purchased with a donation received from Raja Sudhal Deo, Feudatory Chief of Bamra State in Orissa, and one—an ambulance—to be purchased with the donation received from the Ludhiana District "Our Day" Committee. In addition to the above, five of the cars mentioned last year were actually sent out since the 31st of July last. Three other cars have been renovated and re-allotted.

We are very greatly indebted to the ready assistance which is always given us in the matter of information, and to the splendid organization which he has brought into being in Mesopotamia, to Colonel Moens who is the Commissioner there with Major Stanley as Deputy Commissioner of Baghdad. The base depôt is at Basra, the advance depôt at Baghdad, while there are intermediate depôts at Amara and Kut. Among the improvements introduced by the Red Cross in Mesopotamia during the past year may be mentioned the development of flower and vegetable gardens for hospitals and convalescent camps, the establishment of recreation rooms for hospitals and camps, the fitting of hot boxes on launches and the removal of the base depôt to a better site. There is also a scheme for establishing recreation huts, towards which Lady Popham Young has led the way by collecting Rs. 10,000 in the Pindi Division. I am glad to have this opportunity of conveying publicly to Colonel Moens and his staff the cordial acknowledgments of the Joint War Committee for all the assistance he has been to us in India, and, if I may do so without impertinence, to convey, on behalf of this meeting, our cordial thanks for the inestimable services he has rendered to our troops, whether British or Indian, in Mesopotamia.

We were desirous, in connection with our reorganization scheme, to see whether it was possible more closely to forecast the amount and nature of the supplies likely to be required by the Red Cross Commissioner during the ensuing year and also to devise means to avoid over-

lapping, which had been occasioned owing to the practice of some provincial organizations sending direct supplies to hospitals in Mesopotamia.

It was further hoped to bring about a closer definition of the spheres of Government and Red Cross supplies to hospitals in Mesopotamia. His Excellency the Commander-in-Chief readily permitted the Joint War Committee to institute these inquiries and approved of our sending Major Madden and Captain the Chief of Jamkhandi to Mesopotamia on this mission. Major Madden and the Chief left for Mesopotamia in January and returned about a month later, after visiting Basra and Baghdad, and on their return submitted a report dealing with the points mentioned above which have since been satisfactorily settled. I am glad to be able to mention here not only that Major Madden and the Chief reported enthusiastically regarding the organization generally of the Red Cross work in Mesopotamia but placed on record that it was abundantly evident that "to the Red Cross a sick man is a sick man and that every nationality, every creed and every caste shares equally and without question in the comforts provided by the Red Cross."

I will not weary you by dwelling long upon the work of the Bombay Depôt; but when I mention that the value of the stores despatched during the year to Mesopotamia was over 27½ lakhs, to East Africa nearly a lakh, and that those supplied to war hospitals, etc., in India amounted to nearly four lakhs, it will be appreciated that the depôt was extremely active. It is perhaps not generally realized that many of the supplies and gifts which come from all parts of India and from outside India (*e.g.*, New Zealand) are sent in original cases, practically all of which have to be unpacked and checked with their invoices and the goods either taken into store or repacked immediately for despatch elsewhere. The efficiency with which this is done reflects—I feel sure everyone will agree—the greatest credit upon Major Davies and all his many helpers at the Bombay Depôt. Before leaving the extra-Indian side of our activities, I should like to mention that at the end of September last, Sir Pardey Lukis cabled home asking whether we might send some Red Cross stores to East Africa with General Scott. The Home Committee accepted his offer and General Scott took with him over 200 packages which were followed later at General Scott's suggestion by further supplies. The total value of stores sent amounts now to more than Rs. 80,000.

The work done at the Lady Chelmsford Special Red Cross X-Ray Hospital and at the Special Red Cross War Hospital, Dehra Dun, has gone on increasing and the numbers admitted and the work falling upon the management have both gone up. I should like to have referred in greater detail to the admirable work which is there being done but I feel that my remarks have already been too long.

I need only detail one more class of activity

with which we have been concerned since last year's meeting, *i.e.*, the organization of Red Cross assistance for the Waziristan Field Force and more recently for the Marri Expedition. On the former, the direct expenditure incurred amounted to Rs. 16,000 and odd during the current year, while on the Marri Field Force about Rs. 11,000 were spent. In both cases, I believe, our assistance was keenly appreciated, while on our side, we are grateful for the cordial co-operation of the Army Medical authorities.

Before closing my remarks I should like to say that the Joint War Committee have not been oblivious of the necessity for forecasting the arrangements that may be necessary after the present war comes to an end. The Joint War Committee in England as well as ourselves feel that the organization which has come into being in both countries owing to the war has proved itself to be of such value that we should contemplate its continuance on a more permanent footing. There is room for Red Cross activities even in times of peace and we are, therefore, consulting provincial authorities on the question of how best to modify our organization for normal times so that it may not in the future be necessary at short notice to bring into being the arrangements which have been found so necessary during the past four years. I will not go into detail now regarding our proposals since they still require to be elaborated, but I may mention that there seems a consensus of opinion that we should have a permanent Bombay Depôt and, affiliated thereto, small branch depôts situated in localities most likely to prove useful in an emergency; while the Ladies' Committees which have done such wonderful work in the past will, it is hoped, under the arrangements we propose, be kept together in nucleus form so that when necessity arises, we can build efficiently in the light of the experience which we have gained.

It is impossible, in connection with an occasion of this sort, without detaining this gathering far too long, to recite the names of one in a thousand of those to whom is due such success as the Joint War Committee has achieved during the past year. I have already referred to the invaluable work done by Her Excellency Lady Willingdon and by Lady O'Dwyer, but I feel that I must, at the risk of discrimination, also mention certain others to whom my Committee are specially indebted. I only hope that it will not be felt by the thousands of other workers to whom we are equally grateful that the omission specifically to mention their names is due to any oversight: I can assure them that it is merely due to the necessity for bringing my remarks to a close. We have lately lost the services of Sir William Henry, who for so long acted as Honorary Treasurer of the Joint War Committee and to whose advice we were so deeply indebted: and with him I should like to mention Mr. Litster, our new Honorary Treasurer, who equally with Sir William Henry, co-operated to render our organization financially

efficient. I have already mentioned that a provincial depôt has been established in the United Provinces and I should like to express the cordial acknowledgments of the Executive Committee to Sir John Campbell who has organized it and whose work has been of such value in the United Provinces. Lady Robertson in the Central Provinces has similarly brought her organization to a pitch of great efficiency, while Mrs. Tuke and Mrs. Barton in Karachi and Pindi, respectively, have done yeoman's service. In Assam we had in Sir Archdale Earle a representative who consistently supported us and kept alive in that province a very active interest in the Red Cross movement. I do not here attempt to recapitulate the munificent donations given and help afforded to the "Our Day" fund by the hundreds of Ruling Princes and others. These have been separately acknowledged; but I do wish to take this occasion for thanking the many other Indian Chiefs and Gentlemen who have directly helped the Joint War Committee in the past twelve months; notably Raja Sudhal Dev of Banra in Orissa, Rani Abheyswari Debi of Assam already mentioned, and Their Highnesses the Maharajas of Patiala and Jhind. In conclusion, I should like to express, on behalf of the Joint War Committee, our sincere gratitude to the Working Party, of which we see most at headquarters, namely, the Simla-Delhi Ladies Party, who under Her Excellency's Presidency and administered so ably by Mrs. Maffey, Mrs. Bingley and other ladies, have supplied such vast quantities of clothing and other necessities for the troops in Mesopotamia. If I may do so appropriately here, I should also like to convey my personal obligations to the members of my Working Committee and to those of the Finance and Medical Sub-Committees who have rendered possible the introduction of the reorganization scheme, and finally to the members of the headquarters office for their assiduous and devoted labours.

Sir Claude Hill, in concluding his speech, said: The Joint War Committee are in a better financial position than they have hitherto occupied, but in arriving at the position they assume a continuance of the general help which all classes alike in India have extended in the past to the movement, and we feel that all contributors and workers, if they truly appreciate what the work of the Joint War Committee means, will be unremitting in continuing their help to the organization. I would like to quote a few words of President Wilson when inaugurating the Red Cross movement in America. President Wilson said, "the duty of the Red Cross is a duty of mercy and succour and friendship" and again "friendship is the only cement that will ever hold the world together and the intimate contact of the great Red Cross is going to be one of the greatest instrumentalities of friendship the world has even seen." I feel confident that such work will appeal whole-heartedly to this country and that we need be under no anxiety lest there should be relaxation of effort

or taking off the hand from the plough until the end of the furrow has been reached.

His Excellency the Viceroy then addressed the meeting as follows:—

THE PRESIDENT'S SPEECH.

Sir Claude Hill, in presenting the report of the activities of the past year, has very rightly given a front place to the loss which we have sustained through the death of Sir Pardey Lukis. It is no exaggeration to say that Sir Pardey Lukis was the Association and that it lived, moved and had its being in him. No man died more truly in the service of his country than Sir Pardey Lukis, and he came by his death largely through the overwork which was his lot during the last months of his life. Many tributes have been paid to his memory, but it will ill-befit us on the occasion of this annual gathering at which he was such a prominent figure, if I did not once more place on record our appreciation of his inestimable services.

With the death of Sir Pardey it became necessary to reconstruct our Executive, and we were fortunate in being able to secure the services of Sir Claude Hill, who has reorganized the work of the Joint Committee of St. John's and the Red Cross in the manner described in his speech.

There is one matter, however, on which I would lay special stress. As those who have been present on former occasions are aware, I have always emphasized the fact that it is the duty of the Red Cross to supplement the work of Government and not to do the work of Government in respect of the sick and wounded. There has never been any disinclination on the part of Government to do its share, but there has been a not unnatural unwillingness on the part of the Red Cross to give up spheres of work which it had undertaken and rightly undertaken.

In the early days of the war it was easier for private associations than for the Government to put their hands on and provide requisites such as motors and motor launches. This was the case both in England and here. Now the converse is the case. Private associations cannot get such things except through the Government, and as it is obviously the duty of the Government to provide them, it has been decided that the Red Cross should leave this responsibility to Government. It is clearly wrong to indent on private generosity for public needs. The arrangement has therefore been come to under which the Red Cross confines its activities to the provision of only those articles which ease the care of the sick and wounded. It will always be the duty of the Red Cross to be ready to supplement, not to bear the full burden.

It was for this reason that we recommended to the Presidency of Madras to hand over to the Government their hospital ship. Madras have done a fine work through this ship, and I must place on record my appreciation of what they have done. I hope and feel confident that

they will not relax their efforts on behalf of Red Cross work. There is still ample scope for help and I look forward to its being forthcoming in an undiminished degree.

But while reorganization has meant on the one hand a certain curtailment of activity, it will mean on the other a recognition of further responsibility. The Red Cross has come to stay. It must, therefore, be prepared for all eventualities and not be content to improvise effort when occasion arises. As you are aware, the Red Cross was to the front both in the Mahsud and the Marri expeditions. But in both those cases it was necessary to improvise on the spur of the moment. In the future we should be ready through advance depôts with our stores comparatively close to the scene of action, only needing to be supplemented from the rear as the necessity arises. I hope then that subscribers will fully appreciate the situation. Their interest must not slacken because Government have assumed the responsibilities in this present war which are clearly theirs. There is still ample field for interest and co-operation, and they may rest assured that the resources of the Red Cross and St. John's are being mobilized so as to be most effective where and when occasion demands.

The work of the Association has been wonderfully simplified by the great results achieved on "Our Day." Sir Claude Hill has paid a tribute to the admirable work done by the provinces. I do not underestimate the great efforts made by the larger provinces, but one must not forget the smaller units. Measured in lakhs of rupees, their contributions do not catch the eye, as do the sums gathered in by the larger provinces. But taking them on the *per capita* basis the smaller provinces and administrations deserve our admiration, gratitude and thanks every whit as much as do the larger areas. I must not however pass over without mention the headquarters staff who organized "Our Day." We are deeply indebted to Mr. Buck and his colleagues for their ungrudging labours, which contributed so largely to the success which was achieved.

And now, as Sir Claude Hill has told you, we are in a happy position financially, and for the moment I shall leave the matter there. But let us clearly envisage the future. We are just completing the fourth year of the war. We have no intention of laying down our arms until we do so on our own terms and those victorious terms. A German authority the other day reminded his countrymen that throughout history England had always emerged victoriously from its great wars. We of this generation have no intention of falling short of this great record and, come what may, we shall go through to the same end.

And we, who are not in the field, must be prepared to play our part. Throughout the centuries the effort of civilization has been to soften the rigours and miseries inseparable from war. Our foes have preferred to hark back to the days

of Attila and the Huns. All the greater call upon us to alleviate pain and suffering. We know no distinction of race or colour or class. We only know that where pain and suffering and death are, there is the work of our Association. Our hospitals, our nurses, our agents bear the badge of the Red Cross which should, by all treaties and conventions, carry immunity from deliberate hurt. We know now that that is not the case. They are the aim and target of the enemy's hate equally with our soldiers. One more reason, if reason were needed, for our unsparing and ungrudging help.

We shall not have to make an appeal in the immediate future on the lines of last year's effort. We shall be able to rely, I trust, on the constant flow of annual subscriptions. But if the necessity arises, I shall not hesitate to appeal once more to India, and I am confident that should that appeal be made, India will again rise to the height of her opportunity.

Treatment of Pruritus by Ionic Medication.

Boston Medical and Surgical Journal, August 14th, 1919.—W. A. ROLFE, M.D., Boston.

THE research work of Murray (J. A. M. A., November, 1918), has shown that the condition is dependent on the infection of the peri-anal skin by the streptococcus *fæcalis*. Murray found this organism in 168 of 181 cases examined bacteriologically by him; he reported good results from an autogenous auto-streptococcic vaccine in 99 out of 113 cases treated by him. He states that the opsonic index for streptococcus is low in all cases of the complaint, but cannot say whether the low index is the primary condition, or a result of the infection.

The author has been using ionic medication for non-malignant ulceration of the rectum, fissures, cryptitis, and pruritis for over six months. The number of cases treated was 30. The duration of the disease varied from 8 months to 35 years. In all cases the itching was relieved. In six cases in which the skin was dry and fissured, a return to normal appearance was noted after twelve to fifteen treatments given twice a week.

During the treatment no anti-pruritic ointment or washes of any kind were employed, but strict cleanliness of the part was insisted on. Patients were instructed to wash the parts with hot water and soap after each defæcation and always before retiring. In cases where the skin was moist and macerated, a simple talcum dusting powder was ordered.

In refractory cases it would appear to be logical to combine autogenous vaccine treatment with ionic medication.

The apparatus used consisted of a portable motor transformer for us with direct current capable of cutting voltage down to 40 and fitted with a milliampere meter reading up to 10 milliamperes.

Two electrodes are used. The one electrode is 18 cm. square covered with a layer of

felt 1 cm. thick. The active electrode of zinc or aluminium 6 cm. in diameter is bent in such a manner as to fit the fold between the nates.

This electrode is also covered with a layer of felt.

Method of use.—The author used two solutions in the treatment of pruritus ani; a 2 per cent. solution of zinc chloride in distilled water, and Lugol's solution of iodine.

The patient is placed in the right Sims position with legs well drawn up. The large felt-covered electrode, wet with a 3 per cent. solution of sodium chloride, is slipped under the right buttock and connected with either the positive or negative wire, depending on whether a zinc or iodine solution is to be used.

It is important to place the active electrode in position before allowing the current to flow through the milliammeter, and also equally important to return the needle of the meter to 0 before removing the electrode for any purpose. By observing this precaution, the patient will not experience any unpleasant sensation.

Cases showing a moist, macerated condition of the skin are treated for the first two or three times by the application of the active electrode well saturated with 2 per cent. zinc solution and connected with the positive or red cord. This preliminary treatment has a stimulating effect on the skin, which becomes somewhat less moist and presents a more healthy appearance. After two or three applications which should last from 15 to 20 minutes, Lugol's solution of iodine is used, diluted with 4 parts of distilled water. This is applied with the negative pole and continued in subsequent treatments in gradually increasing strength as the skin becomes more and more tolerant until such time as the undiluted solution can be employed.

As iodine ions penetrate deeper and at a faster rate than the zinc ions, the time of application can be reduced to about one-half that of the zinc solution. It is well to begin treatments with a mild current of perhaps 2 or 3 milliamperes, gradually increasing the amount until the patient begins to complain of a warm sensation. There is no need of causing pain and the amperage should be kept below the painful or so-called irritation point.

Cases presenting a dry, thickened, parchment-like condition of the skin are treated from the beginning with dilute iodine solution, the strength of which is gradually increased in the manner already stated.

The applications should be given at least twice weekly and three times would be better unless the skin shows signs of irritation, which is to be avoided if possible, either by prolonging the interval between treatments or using the solutions in much more diluted form.

The number of applications necessary varies with the chronicity of the case, the long standing ones requiring more. It is well to continue the treatments for two or three weeks after the disappearance of the pruritus, but once or twice a week will be sufficient.

A New Sign of Nerve Regeneration.

Boston Medical and Surgical Journal, August 7th, 1919.—I. H. CORIAT, M.D.

Tinel in his work on "Nerve Wounds" drew attention to "le signe du fourmillement," or formication sign, a new and important sign of nerve regeneration. This test, when taken in conjunction with the return of electrical conductivity and selective sensory regeneration, is of great practical importance.

Formication appears at a very early stage in nerve regeneration, usually about the fourth to sixth week, while the return of electrical conductivity is a late development. Formication in a nerve indicates the presence of young axis-cylinders.

When defective regeneration leads to the formation of neuromata, the formication will be limited to the area of the neuroma or scar tissue and not radiate down the peripheral distribution of the nerve.

Tinel's description of this sign is as follows:—"When compression or percussion is lightly applied to the injured nerve trunk, we often find in the cutaneous region of the nerve a creeping sensation usually compared by the patient to that caused by electricity. Formication in the nerve is a very important sign, for it indicates the presence of young axis-cylinders in the process of regeneration. This formication is quite distinct from the pain on pressure, which exists in nerve irritations. The pain indeed, which essentially indicates the irritation of the axis-cylinders and not their regeneration, is almost always local, perceived at the very spot where the nerve is compressed, or at least magnified at this spot; it always co-exists with the pain in the muscular bellies under pressure,—very often the muscles are more painful than the nerve. Formication of regeneration, on the other hand, is but little or not at all perceived at the spot compressed, but almost entirely in the cutaneous region of the nerve; the neighbouring muscles are not painful. As a rule, it appears only about the fourth or sixth week after the wound. It enables us to ascertain the existence of this regeneration and to follow its progress.

"If it remains fixed and limited to one spot for several consecutive weeks or months, this is because the axis-cylinders in their regeneration have encountered an insurmountable obstacle and are forced to group together on the spot in a more or less bulky neuroma.

"The fixity of formication on a level with the lesion and the complete absence of formication below the lesion would almost warrant our affirming the complete interruption of the nerve and the impossibility of spontaneous regeneration.

"If, on the other hand, the regenerated axis-cylinders can overcome the obstacle and make their way into the peripheral segment of the nerve, we see a progressive migration of the formication so provoked. Pressure on the nerve

below the wound produces this sensation, and from week to week it may be met with at a spot farther removed from the nerve lesion. The presence of formication provoked by pressure below the nerve lesion warrants our affirming that there is more or less complete regeneration.

"The zone of formication so brought out changes its place on the nerve at the same time that the axis-cylinders are advancing; it extends progressively towards the periphery at the same time that it disappears at the level of the lesion.

"The 'formication sign' is thus of supreme importance, since it enables us to see whether the nerve is interrupted or in the course of regeneration, whether a nerve suture has succeeded or failed, or whether regeneration is rapid and satisfactory or reduced to a few insignificant fibres.

"Formication lasts a tolerably long time; appearing about the fourth week, it persists during the entire regeneration, *i.e.*, for eight, ten, twelve months or more, gradually drawing nearer the extremity of the limb. It ceases only when the regenerated axis-cylinders have almost regained their adult stage.

"Formication, however, may be absent, both on a level with the lesion and below it; this absence is an unfavourable prognostic point; it shows that the nerve regeneration is taking place imperfectly, mainly because of general disturbance of nutrition.

"The more it extends and shows itself towards the periphery of the nerve, the less marked it becomes, finally disappearing at the level of the portions of the nerve which are nearest the lesion. Consequently there is in the course of the nerve a wide zone of formication which can be brought on; it spreads centrifugally, corresponding to the zone of growth of the young axis-cylinders, and at last completely disappears, when the nerve fibres have regained their fully formed state.

"Let us follow, for instance, the progress of formication on a sciatic nerve sutured in the middle of the thigh; about the fourth week the formication appears at the level of the suture; at about the eighth week it is ascertained to be a few centimetres below; after three months it reaches the popliteal nerves at the upper third of the leg, but at the same time it disappears at the level of the lesion; at the fifth month the nerve formicates on pressure from the popliteal space to the level of the malleoli; finally, in the sixth month, it has reached the feet, but has disappeared as far as the upper third of the leg.

"Formication is the best and almost only sign of regeneration of the nerve; for not only does it enable us to follow the progress of regeneration, but through the intensity, rapidity of migration, and the region in which it appears, it even supplies exact information regarding the quality, extent, or limitation of regeneration.

"If the axis-cylinders stray and lose themselves in the tissues next to the lesion, formication

reveals them; thus, in an interruption of the muculo-spiral, André-Thomas was able to demonstrate the presence of stray axis-cylinders in the muscles of the forearm.

"Any nerve that formicates below the lesion is a nerve in course of regeneration, either partly or wholly; absence of formication over the entire extent of a degenerated nerve trunk is an almost certain sign of absence of regeneration."

We may conclude, therefore, that in formication, we have a valuable sign of nerve regeneration. The test should be carefully applied as the tingling due to neuroma formation may lead to error. In neuroma formation, formication is limited to the level of the lesion, and if, the regenerated axis-cylinders are blocked it remains fixed at the level. In actual regeneration of the nerve, formication progresses over the zone of growth of the axis-cylinders, and can finally be detected along the cutaneous distribution of the nerves. As regeneration becomes complete it disappears from the proximal regions and can only be detected at the periphery.

The cause of formication is probably the increased sensitiveness of the young axis-cylinders.

Report on the Anti-malarial Campaign at Kurunegala.

By

Dr. S. T. GUNASEKARA.

KURUNEGALA is the capital of the North-Western Province of Ceylon and is the centre of an important agricultural district. The town is 381 feet above the sea-level. The annual rainfall is 80.52 in., and the average number of wet days 163. The average temperature 79.8 F. The district has a notorious reputation for Malaria. There are, as a rule, two malarial seasons, each following the monsoon rains.

The following is a summary of the measures carried out:—

I. Field work: This consisted in—

- (1) Searching for breeding places of anophelines and dealing with them when found;
- (2) Carrying out observations on paddy fields as possible breeding places of anophelines and investigating their connection with local malaria.

II. Treatment of Malarial Patients:

- (1) At Town Hall.
- (2) At schools.
- (3) Distribution of quinine.

III. Laboratory work consisted in—

- (1) Determination of species of anopheles found in Kurunegala.
- (2) Identification of the local carriers of malaria.
- (3) Investigation into the varieties of malarial parasites found in Kurunegala.
- (4) Experiments into various larvicidal substances.
- (5) Experiments with, and observations on, fish and other natural enemies of mosquito larvæ.

The anti-malarial measures that were carried out may be conveniently and more scientifically described under the following heads:—

- (i) Measures against anopheles.
- (ii) Measures against the malarial parasite.
- (iii) General measures.

Measures against anopheles are:—

- (1) Search for, and abolishing, their breeding places.
- (2) Destruction of mosquito larvæ.
- (3) Rendering breeding places of larvæ unfit for harbouring them.
- (4) Prevention of formation of possible breeding places.
- (5) Removal of conditions affording shelter for mosquitoes.

Breeding places of anopheles at Kurunegala:—These may be divided into two main classes: (a) Natural; (b) Artificial.

(a) Natural breeding places. These are:—

- (1) Streams and water-courses.
- (2) Collections of storm water in natural hollows and low-lying land.

(b) Artificial breeding places:—

- (1) Paddy fields.
- (2) Earth drains.
- (3) Irrigation channels.
- (4) Burrow-pits.
- (5) Metal quarries.
- (6) Wells.

Anopheles mosquitoes found in Kurunegala.—The following list gives in order of frequency the varieties of anopheles so far found in Kurunegala town:—

- (1) *Myzorrhynchus barbirostris*, Van der Wulp.
- (2) *Nyssomyzomyia Rossi*, Giles.
- (3) *Myzorrhynchus sinensis*, Wiedmann.
- (4) *Myzomyia culicifacies*, Giles.
- (5) *Nyssorrhynchus fuliginosus*, Giles.
- (6) *Nyssorrhynchus Jamesi*, Theobald.
- (7) *Nyssomyzomyia punctulata*, James and Liston.
- (8) *Nyssorrhynchus maculatus*, Theobald.
- (9) *Myzorrhynchus albirostris* (rare).
- (10) *Myzomyia Listoni*, Liston (rare).

RESULTS OF THE CAMPAIGN AND RECOMMENDATIONS.

The following conclusions may be drawn from the results of the investigations carried out:—

- (1) That the paddy fields are the chief breeding places of anopheles in Kurunegala.
- (2) That there are at least five species of anopheles breeding in these paddy fields, which are proved carriers of malaria.

(3) That the only method of preventing the breeding of anopheles in paddy fields is to prohibit their cultivation. Agricultural experts who have gone into the question declare that the substitution of dry products, such as coconuts, would pay better.

(4) That such measures as the use of screened rooms, mosquito-nets, prophylactic quinine, etc., will never become universal, as only a small proportion of the town people can afford them.

(5) That "minor works" alone, however long continued, are insufficient to eradicate local malaria.

Results of the campaign on incidence of malaria.—In considering the effect of the campaign on the incidence of malaria, it should be borne in mind that anti-malarial measures have been in force only a short time, and that the most extensive of the breeding places, namely, the paddy fields, remain untouched. In these circumstances a marked diminution in the amount of malaria can hardly be expected. However, there is an appreciable diminution in the number of malarial patients who come for treatment to the Town Hall and to the Government hospital, particularly from the bazaar portion of the town.

Unfortunately, no statistics are available for the purpose of comparing the malaria incidence within the town and without. Since the commencement of the out-patient work, separate records are kept, and will be available for future reference.

Results of the campaign on spleen-rate.—With the object of ascertaining the effect of the various anti-malarial measures that were in force, particularly the treatment of malaria and of enlarged spleen, a splenic survey was undertaken during the last week of July, 1913. The census was limited to those parts of the town where the majority of school children and those having recourse to regular treatment at the Town Hall lived.

Appendix VII of the Report gives the results in tabular form, and a comparison of them, with the figures of the census, made at the beginning of the campaign. From this it will be seen that the spleen-rate has been reduced from 56.97 to 22.47, and the average spleen from 2.88 to 1.87.

Results of treatment of school children suffering from enlarged spleen.—Treatment was carried out fairly regularly during a period of nine months. The results are given in detail in Appendix VIII. Only those children who were treated for two months and over have been included. Out of 118 children regularly treated 59 had their enlargement completely reduced, 48 partially reduced, and only 11 were not improved—percentage benefited 90.67. Further, it was found that the children under regular treatment did not suffer from relapses of malaria.

Cost of the campaign.—The total cost of the twenty-two months' campaign is Rs. 14,974. However, this sum does not include the cost of quinine used. A detailed statement of the expenditure will be found in tabular form in Appendix IX.

Co-operation of householders.—As a rule there was no difficulty in inducing the people to attend to the sanitary condition of their houses and gardens, but a certain number of persons had to be prosecuted for not filling in or draining breeding places of anopheles, and in all cases the culprits were fined. The prosecutions were instituted under the ordinary sanitary by-laws relating to nuisances.

Several owners of houses carried out various anti-mosquito measures, especially filling in or draining pools and burrow-pits at considerable expense. One public-spirited landowner, who appreciated anti-malarial measures, abandoned the cultivation of a very fertile block of paddy field on the Dambulla road and close to an important residential quarter. The land has since been drained and planted with coconuts; the health of those living in the neighbourhood is bound to be improved in consequence, for these paddy fields used to be a fertile breeding place of anopheles.

As regards treatment of malaria, I found it difficult to induce even the intelligent section of the town people to continue taking quinine sufficiently long to effect a permanent cure. The majority of patients cannot be made to realize that temporary freedom from fever is not a cure, and that a fairly prolonged course of quinine treatment is necessary in order to destroy the parasites of malaria in the blood, which alone will effect a permanent cure.

Recommendations for future work.—In addition to the work now being carried out, I venture to make the following recommendations, which include certain general sanitary measures. These are based on the conclusions reached as a result of the observations recorded above:—

(1) Wet cultivation within town limits should be prohibited, and paddy fields drained under proper supervision.

(2) A suitable drainage system with house connections should be devised and constructed in sections annually, if necessary, first taking up the crowded parts of the town.

(3) The existing irrigation channels should be graded and extended, where required, to serve as outlets for storm water.

(4) The "sump," or cemented tank, in the railway yard should be connected with the Wenaruwa-wewa by means of piping.

(5) The town should be provided with a pipe-borne water supply. However, before this is done the drainage system should be working; otherwise a large number of artificial breeding places will result.

(6) All cesspits in the town to be closed, and a system of dry-earth conservancy substituted.

(7) The measures now in force should be continued indefinitely, the amount of malaria being estimated periodically by ascertaining the spleen-rate and the parasite-rate so as to gauge results and to modify the scheme accordingly.

Studies in the Treatment of Malarial

Annals of Tropical Medicine and Parasitology.

THE following are some of the conclusions arrived at from studies in the treatment of malaria by Stephens, Yorke, Blacklock and Macfie:—

An intramuscular injection of quinine bihydrochloride grains 15 in 2 c.c. of water on each of two consecutive days only, causes the cessation of febrile paroxysms and effects the disappearance of trophozoites from the cutaneous blood in malignant tertian malaria. The action, however, is only temporary, a relapse occurring within three weeks, occasionally within a few days.

As a palliative, quinine sulphate grains 30 on each of two consecutive days weekly, over a period of five weeks, suffices to keep the blood free from trophozoites and to prevent relapses in the great majority of cases. It is noteworthy that the percentage of cases having crescents in the peripheral blood diminishes each week, viz., from 50 per cent. in the first week to 6 per cent. in the fifth week of treatment.

Under quinine treatment grains 30 or 45 daily, crescents do not persist in the cutaneous blood in the majority of cases for more than three weeks.

Novarsenobillon in the doses used is of no value in the treatment of malignant tertian malaria.

A combination of arsenic (Novarsenobillon or Liquor arsenicalis) with quinine in the doses used is not more effective than quinine alone.

The action of novarsenobillon on *Plasmodium vivax* is marked. In this infection its action is even more rapid and efficient than that of quinine, a single intravenous injection of 0.9 gramme causing the disappearance from the cutaneous blood of all stages of the parasites within twenty-four hours. In the case of *P. falciparum* and *P. malariae* novarsenobillon in the same dosage has no appreciable effect on the temperature or on the parasites.

An intramuscular injection of the bihydrochloride of quinine grains 15 on each of two consecutive days only, exerts in the case of *P. vivax* a constant and rapid effect both on the temperature and the parasites; in the case of *P. falciparum* the action on the temperature and trophozoites is also well defined, though relapses occur more quickly than in the case of *P. vivax*, whilst in the two cases of *P. malariae* treated in the same way there is little if any effect on the parasites, but in one of the two cases the temperature was controlled.

Quinine hydrochloride in the doses used is of no value in the treatment of simple tertian malaria.

HESS (Alfred F.) and UNGER (Lester J.). Canned Tomatoes as an Antiscorbutic.—*Proc. Soc. Experim. Biol. and Med.* 1918. Oct. 16. Vol. 16. No. 1. pp. 1-2.

GIVENS (Maurice H.) and McCLAUGAGE (Harry B.). Preliminary Observations on the Value of Raw and Dried Tomatoes as Antiscorbutic Foods for Guinea-pigs.—*Ibid.* pp. 2-3.

Series of guinea-pigs were fed on diets of hay, oats and water with and without the addition of 5 c.c. of canned tomatoes. These died of scurvy; those were protected, as is shown in a graph. Canned tomatoes have been given to babies in lieu of orange juice with good results.

The same effects were obtained with a different diet and 10 grms. of raw tomatoes, used either preventively or curatively. Tomatoes, dried under conditions described, retain some of their antiscorbutic properties.—*Tropical Diseases Bulletin.*

Plague in India.

TWENTY Years of Plague in India with Special Reference to the Outbreak of 1917-18.—*Indian Jl. Med. Res.* Oct. 1918. Vol. 6. No. 2. pp. 190-236. MAJOR F. NORMAN WHITE.

This report to Government was not originally intended for publication in a Journal, but the matter contained was considered to be of such interest as to warrant its publication in its present form. As the result of his investigations the author summarizes his conclusions as follows:—

"(1) Severe outbreaks of plague have been, more especially during the last decade, an expression of climatic conditions. Rainfall in defect of normal is inimical to plague. The excessive rainfall of 1917 was responsible for the abnormally severe nature of the recent epidemic.

"(2) That in most of the severely plague-infected parts of India there is a very well-defined 'plague-free' season, which, in favourably dry years, provides opportunities for measures aimed at the eradication of the disease, given an adequate reporting agency and the necessary staff for carrying out rat destruction measures. During the last five years, there have been months when the total plague mortality has been as low as 2 in the Punjab, 19 in the United Provinces, 468 in Bombay, 15 in Bihar, nil in the Central Provinces, nil in Rajputana, 5 in Madras, nil in Bengal, nil in Central India, nil in Hyderabad and 56 in Mysore. Granted that these figures understate the case there are months in most provinces in which the number of foci of infection are sufficiently small to justify the hope that when public health organization of India is commensurate with the importance of the work to be done, plague will rapidly cease to be a serious cause of mortality in India. At the present time India is by far the most important reservoir of plague infection in the world.

"(3) In most of the severely plague-infected areas of India there are signs that the disease is decreasing in virulence; this decrease is almost certainly due to the increasing degree of immunity to plague of the rat population, of which there is direct experimental evidence; it can in no wise be attributed to increasing efficiency of our anti-plague measures.

"(4) Once considerable tracts of India have been completely freed from plague infection, the task of keeping them free will not present very great difficulties. Infection is not easily spread over distances, except along main lines of communication. Though Bombay was infected in 1896, and has never since been free from infection, the disease did not gain a firm foothold in the United Provinces till the beginning of 1901; in the Central Provinces till 1902; in Rajputana till 1903; in Central India till 1902; and in Burma till 1905. There are towns in India that suffered from their first outbreaks of indigenous bubonic plague in the recent epidemic of 1917-18. Of these the most interesting is Vizagapatam on the Madras coast.

"(5) Pending the establishment of permanent health organizations for the rural areas of India, in which reside more than ninety per cent. of the total population, a good deal more than is being done at present might be done to lessen the incidence of plague. Improvement in markets and the grainstores of towns in which rat infestation at present is most excessive, and the—not necessarily vexatious—control of movements of grain and like merchandise, from and through plague-infected centres, are matters that call for early attention. The co-operation of railway companies would do much; at the present time goods-sheds and railway sidings are frequently heavily infested with rats which find ready access to wagons.

"(6) If educated people would unite in an effort to inculcate far and wide some idea of the significance of the statement that ten million people in India have fallen victims to plague; of the economic loss that India has suffered from the ravages of plague; of the wholesale disorganization to which industry is liable for several months in severe plague years; of the

absolute dependence of plague epidemics on rat infestation, and of the very considerable financial loss suffered as a result of the depredations of rats, the Indian plague problem would find a ready solution. Of all preventable diseases none is more preventable than is bubonic plague."—*Tropical Diseases Bulletin*.

DE BRUN (H.). Pneumonies grippales et peste pneumonique.—*Bull. Acad. Med.* 1918. Nov. 12. 3 Ser. Vol. 80. Year 82. No. 45. pp. 437-445. (From *Tropical Dis. Bulln.* June 15, 1919.)

The differential diagnosis between influenzal pneumonia and pulmonary plague presents but little difficulty. The character of the sputum in the latter condition is quite characteristic—at first scanty and of thin consistence it soon changes in character and becomes hæmorrhagic. Plague bacilli, moreover, can always be demonstrated in the sputum, and in the author's experience, pneumococci and Pfeiffer's bacillus are never present. In addition to this, blood cultures are always positive for the plague bacillus. As a point in clinical diagnosis the author lays particular stress on the early and persistent dyspnoea in pneumonic plague.

Beri-Beri.

WALSHE (F. M. R.). On the "Deficiency Theory" of the Origin of Beri-beri in the Light of Clinical and Experimental Observations on the Disease, with an Account of a Series of Forty Cases.—*Quart. Jl. Med.* 1918. July. Vol. 11. No. 44. pp. 320-338. (From *Tropical Dis. Bulln.* June 15, 1919.)

The observations were made on a series of cases of peripheral neuritis in men from Mesopotamia, treated in hospitals at Alexandria. The paper is divided into seven parts, describing the cases and discussing the various theoretical problems, with a summary of the conclusions arrived at.

From the clinical aspects and on the grounds of their etiology, the cases may be regarded as true beri-beri; there was no evidence to support the theory that this or similar outbreaks occurring among the troops bear any relationship to epidemic jaundice or are of an infective nature. Recent clinical and experimental work shows clearly that the hypothesis which postulates a single negative factor, namely, the absence of a specific "accessory food factor" or vitamine, is inadequate. This conflicts with the results obtained in starvation experiments in fowls, for starved fowls live long enough under such conditions to develop the disease, yet they die without doing so, for starvation is the equivalent of an anti-vitamine diet.

It is apparent from all recent experimental work both in men and birds that there are two factors in the production of beri-beri, (1) the absence of an "accessory food factor" or vitamine, (2) the use of certain foods which are the direct and immediate cause of the disease. There is a considerable amount of evidence to prove that carbohydrates constitute this second factor. It seems probable that in the absence of their special vitamine they undergo an aberrant hydrolysis with the production of toxic by- or end-products, thus producing beri-beri. The striking symptoms of beri-beri and the widespread visceral and nervous changes on post-mortem are not compatible with the theory that it is a slow progressive diffuse degeneration of the nervous system.

A consideration of the physical and chemical properties of vitamines suggests the probability of their belonging to the class of bodies known as enzymes and thus being concerned in the hydrolysis of carbohydrates. The observations of Holst and Fröhlich showing that a diet of decorticated rice or barley may produce either polyneuritis or scurvy according to

whether fowls or guinea-pigs are employed, throw some doubt on the separate identity and specificity of anti-neuritic and anti-scurvy vitamines.

The pathogenesis of beri-beri will remain in part obscure until the physical chemistry and metabolism of beri-beri have been more fully investigated. The genesis of the disease may be best expressed by saying that the use of certain foodstuffs, probably carbohydrates, in the absence of their accessory food factors or vitamine, directly causes beri-beri; the absence of vitamines alone is both inadequate to explain all the facts and incompatible with certain of them.

The Pathogenesis of Deficiency Disease.

British Medical Journal, February 15, 1919.—

LIEUT.-COL. ROBERT MCCARRISON, M.D., D.Sc., F.R.C.P., I.M.S.

IN a foot-note it is stated that the original paper, of which this is an abstract, will appear in the *Indian Journal of Medical Research*.

The author writes: "The influence of vitamine deficiency on the adrenal glands, on the pancreas, on the liver and the spleen is, so far as I can ascertain from available literature, unknown; while that on the thyroid apparatus has been incompletely studied." He points out that we are no better informed with respect to other important structures, as for example, the pituitary gland and the reproductive organs. These gaps he has attempted to fill up. He believes that many of the minor maladies of children are due to incomplete provision of these substances in the food or their incomplete assimilation. The conclusions reached as a result of experiments on a large number of pigeons are as follows:—

"(1) The absence of certain accessory food factors from the dietary—improperly termed 'anti-neuritic'—leads not only to functional and degenerative changes in the central nervous system, but to similar changes in every organ and tissue of the body. The morbid state to which their absence gives rise is not a neuritis.

"(2) The symptom-complex resulting from the absence of these substances is due (a) to achronic inanition; (b) to derangement of function of the organs of digestion and assimilation; (c) to disordered endocrine function; (d) to malnutrition of the nervous system, and (e) to hyperadrenalinæmia.

"(3) Certain organs undergo hypertrophy; others atrophy. Those which hypertrophy are the adrenals. Those which atrophy, and in the order of severity named, are the thymus, the testicles, the spleen, the ovary, the pancreas, the heart, the liver, the kidneys, the stomach, the thyroid, and the brain. The pituitary gland showed in adult birds a slight tendency to enlargement in males only.

"(4) The enlargement of the adrenals is a true hypertrophy in so far as it is associated with a proportionate increase of the glands' adrenalin content. The quantity and quality of adrenalin in the hypertrophied organ is, area for area, approximately the same as that found in the adrenals, in health. The hypertrophy is equally well marked in both sexes.

"(5) Œdema has invariably (100 per cent.) been associated with great hypertrophy of the adrenal glands, while 85 per cent. of all cases having great hypertrophy of these organs had œdema in some form. The amount of adrenalin, as determined by physiological methods, in such cases has been considerably in excess of that found in cases not presenting this symptom, and greatly in excess of that found in normal adrenals.

"(6) Inanition gives rise to a similar state of adrenal hypertrophy, and to a similar state of atrophy of other organs, the brain excepted.

"(7) The œdema of inanition and of beri-beri is believed to be initiated by the increased intracapillary pressure which results from the increased production of adrenalin, acting in association with malnutrition of the tissues. Failure of the circulation and venous stasis may subsequently contribute to it. Age is an important factor determining its occurrence. This finding is held to account in great measure for the occurrence of 'war œdema' amongst prisoners of war in Germany.

"(8) Wet beri-beri and dry beri-beri are essentially the same disease; the former differs from the latter in the greater derangement of the adrenal glands.

"(9) Gastric, intestinal, biliary and pancreatic insufficiency are important consequences of a dietary too rich in starch and too poor in 'vitamines' and other essential constituents of the food. It is suggested that some of the obscure metabolic disorders of childhood might be examined from this viewpoint as well as from that of endocrine gland starvation.

"(10) A state of acidosis results from the absence of so-called 'anti-neuritic vitamins'; this state is due to the imperfect metabolism of carbohydrates and to acid fermentation of starches in the intestinal tract. Clinically, it is evidenced by progressive slowing and deepening of the respirations.

"(11) Great atrophy of muscular tissue results from deficiency of accessory food factors; it is due in part to the disturbance of carbohydrate metabolism in consequence of disordered endocrine function, in part to the action of the adrenals in supplying blood to the vegetative organs of the body at the expense of the muscles.

"(12) Profound atrophy of the reproductive organs is an important consequence of 'vitaminic' deficiency. It leads to the cessation of the function of spermatogenesis. In the human subject such degrees of atrophy would result in sterility in males and in amenorrhœa and sterility in females. This finding is held to account in great measure for the occurrence of war amenorrhœa.

"(13) The central nervous system atrophies little; paralytic symptoms, when they occur, are due mainly to impaired functional activity of nerve cells; much more rarely to their degeneration.

"(14) It is thought that, because of their atrophy out of all proportion to other tissues, the thymus, the testicles, the ovary, and the spleen provide a reserve of accessory food factors for use on occasions of metabolic-stress. This reserve, however, is rapidly exhausted.

"(15) The bones are thinned and there is a loss of bone marrow.

"(16) The red cells of the blood are diminished by about 20 per cent."

Formalin Treatment of Bed-Sores.

The Hospital, August 23, 1919.

In addition to generally accepted measures such as cleanliness, frequent change in position, and special air or water beds, the following is recommended as having been attended with considerable success in several American hospitals:—

Formalin solution, 1 part of the 40 per cent. solution in the 200 parts of water. The sores are first washed with plain warm-boiled water and the cold formalin solution then applied by means of a syringe. At first the procedure should be repeated several times a day. The dressers' hands should be protected by means of rubber gloves. In the intervals between the dressings the sore should be dusted with subiodide of bismuth.

Physical Therapy in Sciatic Neuralgia.

Faikin (*Journal de Médecine de Bordeaux*), regards physical measures as far superior to drug treatment in true sciatica and as being indicated whenever the use of drugs for ten or fifteen days has failed to yield notable improvement. Even where drugs prove beneficial, physical treatment should be added to hasten recovery. Such treatment is likewise useful in sciatic neuritis, though here results are more slow in appearing. Three forms of physical measures are available,—electric, thermic, and kinesthetic. In using the galvanic current, the negative electrode, measuring about fifteen by twenty centimetres, is placed on the buttock at the point of emergence of the nerve; the foot is dipped in water, which constitutes the positive pole. The intensity of current should be gradually increased to twenty, or in long-standing cases even to forty or fifty milliamperes. Daily treatments of ten or fifteen minutes' duration are indicated. In sciatic neuritis, when pain has been allayed it is well to add faradic treatment of the affected muscles. In intense and rebellious cases, high frequency treatment should be given every other day, in alternation with the galvanic current. Diathermy is also capable of doing good in such cases. The most important of all measures for sciatica, whether employed alone or in combination with other physical means, is the hot air treatment. For this purpose the ordinary hand-operated apparatus, yielding a temperature of eighty to hundred degrees C., is sufficient. The applications should be prolonged to the extent of producing intense rubefaction and be made over each painful area. The hot air should be applied in concentric circles, excessive heating of any given point being guarded against. Daily treatments should be given. If the galvanic current is being used, the hot air should follow it after a rest interval of one half to one hour. Kinesthetic treatment comprises massage, mechanotherapy, and re-educating exercises. Manual massage is serviceable from the onset of the disorder. Effleurage is the first step, to be followed, as improvement occurs, by pressure, pinching, kneading, and vibrotherapy. The latter, whether manual or instrumental, has distinct analgesic properties. Mechanotherapy consists in extension of the nerve—at first, if necessary, with the knee fixed, later with the knee extended. In the re-education exercises the patient is made to walk slowly and correctly, each movement made being carefully supervised until the patient is able to overcome all abnormal positions during locomotion.—*Charlotte Medical Journal*.

The Diagnosis of Myocardial Debility.

THORNE, writing in the *Practitioner* recommends the use of the differential stethoscope in the diagnosis of myocardial debility. This instrument consists of the usual binaural ear-pieces and tubing, connected with a hollow aluminium chamber divided transversely by a septum into two compartments. The upper is connected by tubing to the ear-pieces and the lower is attached to the chest-piece. In the centre of the dividing septum is a conical opening which can be closed completely or varied, by a metal cone attached to a pointer on the upper surface of the chamber which registers its position. According to the position of the cone, more or less of the sounds reach the examiner's ear. The figures on the scale over which the pointer moves give the value of the sounds—indicating when the sound is just audible.

It has been found by experience that the value of the first sound at the apex is double that of the second sound at the base—3.2 to 1.6. If the ratio falls below this—3.2 to 2.4 for instance—it is evidence of myocardial debility.

The differential stethoscope is used as follows :—

Apply the chest-piece to the apex of the heart, having previously rotated the pointer one complete revolution left to right from the closed position. Now slowly close it turning the pointer from right to left until the first sound is just not audible, note the figure of the dial opposite which the pointer stands. Suppose this is 3.2. Next place the stethoscope on the aortic area at the base and repeat the same procedure noting the figure at which the second sound disappears; say, it is 2.4. The ratio 3.2 to 2.4 or 4 to 3 being less than the normal ratio 2 to 1, indicates myocardial weakness.

The author found the differential stethoscope of great value in detecting malingerers, pleading heart weakness, palpitation and breathlessness.

The latest Views on Vitamines.

AN ECONOMICAL SUBSTITUTE FOR FRESH MILK.

WITH the establishment by numerous investigations of the paramount importance of those ingredients of diet which are known as vitamines (and especially so in the case of the young, both of the human species and of animals) has come as a natural consequence a critical attitude towards many articles of infant and adult dietary which have hitherto been taken on trust. In a recently-published research, or series of researches, conducted at the Lister Institute by Dr. Harriette Chick and other workers, and published in the *Lancet** some very important new facts are disclosed concerning the vitamine content of various common articles of diet. And the application of this work, and of other recent researches along the same lines, is discussed in the same journal by Dr. E. A. Barton, medical officer to the infant department of University College Hospital,† who touches also on the economic aspects of the results of these researches.

Those who have followed the progress of recent medical thought on vitamines are aware that these peculiar substances, present only in the most minute quantities in fresh animal and vegetable foods, are of varying natures, as well as of varying quantity, in different foodstuffs. Some of the most important, and it is these that Drs. Chick, Barnes, Hume, Skelton, and Campbell have been investigating, are those which ward off scurvy: their total absence, or relative insufficiency, in the diet of man or animals is followed, sooner or later, by the symptoms, more or less severe (and not always easily recognisable in mild cases), of that peculiar disease. The conclusions reached appear, on the evidence offered, to be valid, though, of course, the data, as well as the inferences founded on them, remain to be confirmed by independent workers.

VITAMINES IN CANNED VEGETABLES.

To begin with, some of the results of "canning" vegetables, from the point of view of vitamine content, have occupied attention. It is not surprising to learn that the greater part of the original anti-scorbutic properties of the raw vegetable is destroyed in this proceeding; indeed, the strange part is that any anti-scorbutic vitamine remains at all. In the case of runner-bean pods the loss is estimated at 90 per cent. of the original value; in the case of cabbage, at 70 per cent. This loss is primarily due to the heating involved in the process of canning; and a further loss may be expected to occur during the period of storage. In the case of green-leaf vegetables, which possess, in addition to the anti-scurvy vitamine, the "fat-soluble" growth-promoting accessory factor, the latter substance is also lacking in the canned material unless the

liquor be also taken. It is strongly emphasised that the value of canned vegetables, as regards anti-scorbutic and growth-promoting properties, must be regarded as negligible.

Of great importance also to those responsible for famine areas of India, and other officials similarly employed, are some researches on dry tamarind, cocum, and mango, which have been thought by distinguished officers of the Indian Medical Service to be efficient anti-scorbutics for troops in the field on the Indian borders. These three dried products are shown to have a small, but definite, anti-scorbutic value. This value is found to be greatly inferior to that of raw cabbage, swede, germinated pulses, orange juice, or lemon juice; but superior to that of carrots, beetroot, cooked potatoes, or raw meat juice, reckoned weight for weight in the natural condition. The low value attached to raw meat juice conflicts with the experience of recent Polar expeditions, where seal meat (cooked or partly cooked) was found in actual experience to prevent, and cure, scurvy better than any other substance. Possibly the caveat entered by Dr. Barton, to be noticed presently, may apply also to these researches, which were carried out on animals, and may not apply in their entirety to human beings.

THE RELATIVE EFFECTS OF FRESH, HEATED, AND DRIED MILKS.

Strange to say, raw milk (of the cow) has been found not to be in the first flight of foodstuffs as regards anti-scorbutic qualities, though it has, of course, very definite properties of that kind. It would be interesting to know whether this statement holds good for calves, as well as for the smaller laboratory animals on which the experiments have usually been tried; for it may be that the milk of any animal contains ample anti-scorbutic vitamines for its own young, but less for the young of other species. As might be expected, it is found that "scalded" milk is inferior to fresh milk in anti-scorbutic vitamine content, and that dried milk is inferior to both. These facts, as the authors quoted observe, form a strong argument for adding an extra anti-scorbutic to the diet of infants nourished on dried milk. The additions recommended are raw orange juice, raw swede juice, and juice of tomatoes, fresh or canned. Grape juice and carrot juice are also good; but not so potent as those previously mentioned. Winter milk is thought to be inferior to summer milk in anti-scorbutic action, owing to differences in the diet of cows at these seasons. Swedes are pronounced to be much superior to mangolds in this respect as winter diet for cows.

Curiously, no significant differences were detected in the growth-promoting properties of raw and dried milk respectively, from which the conclusion may possibly be allowable that dried milk is permissible as an infant food, if care be taken to supply sufficient anti-scorbutic vitamines in another form.

BEARING ON INFANT WELFARE WORK.

The application of these views to infant feeding and to the teaching disseminated through the community by infant welfare centres is obviously of the greatest importance. Yet, as Dr. Barton points out, it may be that the results of research in this matter do not apply so completely to the human young as to that of animals. It has been shown during the war that the absence or destruction of the anti-scorbutic element in dried milk has no apparent influence on growth, nor did Barlow's disease (infantile scurvy, so-called scurvy rickets) appear, save in very exceptional cases. Animals suffer from deprivation of the anti-scorbutic vitamine much more rapidly and more severely than human babies. The reason for this is not yet known, though it may be hoped that future research may reveal it.

Another interesting point raised is that possibly frank scurvy is the last chapter of a disease whose early manifestations are not recognised, but may possibly include defective dentition. At University College Hospital they take no chances, but add the juice of minced oranges, rind included, to the diet of artificially reared babies. The rind is used because

* August 23, 1919, page 320.

† August 23, 1919, page 348.

it contains essential oils which preserve the juice for quite long periods—a small point, but one worth attending to.

ARTIFICIAL "CREAM."

The fat-soluble factor is present in dried milk in sufficient quantity to prevent rickets, as has been mentioned. When the infant will not tolerate dried milk, and diluted cow's milk has to be substituted, the dilution may become an anxiety unless cream is added to the food. Cream now-a-days is prohibitive in price for the poor, so the infant department at University College Hospital has evolved an artificial substitute which is rich in the fat-soluble vitamins, cannot go bad, and is cheap. The following is the recipe for this artificial cream: Beef suet, 40 oz.; olive oil, 5 oz.; syrup, 25 fl. oz.; benzoic acid, 35 gr.; decoction of Irish moss, 70 fl. oz.; water to one gallon. The oil is added to the melted suet and the benzoic acid dissolved in the mixture. The decoction is heated to about 50 degrees and placed in an emulsifier, and the fats are then added at about the same temperature. The emulsion is then worked up, and the syrup and water are added last—a method well worthy of the attention of those in charge of infant welfare centres who wish to do their best in the light of the most modern research for their little patients, and are faced by the difficulty of getting cream either pure or cheap.—*The Hospital.*

Reviews.

PRACTICAL PHYSIOLOGICAL CHEMISTRY.—For Indian Medical Students and Clinical Assistants. By C. C. CALEB, M.B., M.S. (Durham), Prof. of Physiology, King Edward Medical College, Lahore, etc. Messrs. Butterworth & Co., Calcutta, 1919.

PHYSIOLOGICAL CHEMISTRY is a subject that is becoming yearly of greater importance in scientific medicine. The future study of medicine will undoubtedly be very intimately associated with advances in our knowledge of the chemical composition of the body in health and disease. Such real advances as are likely to take place must come and are coming from applied physiological and pathological chemistry. For this reason, if for no other, we welcome the appearance of Professor Caleb's book, which is a real attempt to teach and explain the causes of the occurrence of certain reactions in the performance of important tests.

By a careful study of the subject matter of this volume the student should be able to obtain a real grasp of the underlying causes of the reactions as they occur.

Professor Caleb is to be congratulated on the very high standard he has reached successfully in dealing with the subject matter of the chemistry of the body. He presents a thoroughly up-to-date work on the subject and, at the same time, gives to students an insight into the reason for many of the reactions that, as a rule, are not understood.

The book is very well arranged for laboratory work and should prove itself invaluable in the training of students in the more scientific aspects of medicine.

The publishers are likewise to be congratulated on the fine appearance of the volume and on the manner they have carried out their part in its production.

BOMBAY MEDICAL COUNCIL.

September Session, 1919.

The Hon. Major-General W. E. Jennings, M.D., I.M.S., in the Chair.

Read Government Notification, General Department, No. 5510, dated 2nd July, 1919, nominating Brevet Lieut.-Col. R. M. Carter, C.B., F.R.C.S., I.M.S., as a member of the Bombay Medical Council, *vice* Lieut.-Col. A. Hooton, I.M.S.

The Council considered a notice of motion given by Lieut.-Col. R. Row, M.D., D.Sc. (Lond.), I.M.S., to the effect that when any medical practitioner is charged with reference to rule 78, with infamous conduct in a professional respect including 'covering,' the case, whether disposed of by the Executive Committee or the Council, should be published in such manner as the Council may deem fit, and resolved that the decisions which the Council arrived at in such cases, in addition to being published in the medical press, be sent out to all registered practitioners once a year.

The Council considered a notice of motion by Mr. A. G. Viegas, L.M. & S., to the effect that a representation be made to Government—

(1) For the removal of limitations which have been placed on the possession by qualified medical practitioners of cocaine and its preparations;

(2) for the abolition of the periodical returns in respect of the above drug, which practitioners are now required to transmit for the scrutiny of Excise Inspectors; and

(3) for the restoration of the old form of license for the possession of cocaine, which has been discontinued in favour of a system of permits renewable every year; and resolved—

(a) that Government be moved to extend from one to three years the period of the validity of the special permit which may be granted to registered medical practitioners;

(b) that the quantity of cocaine which registered medical practitioners may possess, be increased from 1 dram to 2 drams; and

(c) that the scrutiny of the account of registered medical practitioners which the Excise Department may have to make may be conducted by an officer of the Department of not lower rank than an Inspector;

and that in respect of opium and its alkaloids or their preparations the same recommendations be made to Government as in paragraph (c) above, regarding cocaine.

The Council considered and rejected a proposition by Mr. A. G. Viegas, L.M. & S. to the effect that a representation be made to Government to the effect that qualified medical practitioners should be exempted from the obligation of having to take out a license for the possession of opium and its alkaloids or their preparations.

The Council recorded a letter from the Bombay Government to the effect that, as at present advised, they were not prepared to

recommend to the Government of India the proposed amendment of the Indian Medical Degrees Act, 1916, by providing therein a definition of the title "Doctor."

The Council resolved to refer to a special sub-committee, consisting of Lieut.-Col. Rose Hutchinson (Chairman), Lieut.-Col. R. Row, Dr. Sorab Nariman and Lieut.-Col. R. M. Carter, for consideration and report, the suggestions regarding medical ethics.

The Council considered a table showing the results of the several professional examinations held in 1918, compiled by the Registrar from such returns as have been supplied by the Licensing Bodies, pursuant to rule 107 of the rules and regulations of the Council, and resolved to incorporate the table in the volume of Minutes of the Council for 1919.

The Council considered a letter from Captain A. G. Tresidder, I.M.S., expressing the opinion that all British qualifications held by Government medical officers should be registrable in India without the payment of fees, and resolved that the practice hitherto followed of charging a fee of Rs. 5 for registering each additional qualification be continued.

The Council considered a reference from the Bombay Government forwarding for report a petition from Mr. J. K. Naidu, who applies for registration under section 7 (3) of the Bombay Medical Act, 1912, as amended by Bombay Act No. III of 1916, and states that he holds the Diploma of Fellow of the National Medical College of Calcutta. It was resolved to inform Government that the Council do not recommend that Mr. Naidu be admitted to registration.

Correspondence.

"GOOD DIGESTION WAITS UPON APPETITE."

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—In his very interesting article, entitled "A Plea for Simplicity in the Prevention and Cure of Bacterial Infection" (*Indian Medical Gazette*, September, 1919), Major R. F. E. Austin states that "the possibility of developing cholera, dysentery or enteric fever from eating salads and raw vegetables, would never be present unless food is taken without a keen appetite. Indeed I am quite certain that the great majority of those who develop these diseases got them from breaking the first law of digestion—'Good digestion waits upon appetite.'" Sometime ago, I was interested in a certain famine-stricken area; both cholera and dysentery were exceedingly prevalent amongst the starving people, and I am quite at a loss how to reconcile this fact with Major Austin's statement. I can vouch for the fact that the people had keen appetites.

Yours, etc.,

T. S. ROSS,

Lieutenant-Colonel, I. M. S.

CALICUT :

29th September, 1918.

HYDROGEN PEROXIDE IN CHOLERA.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—I read a note from the pen of Dr. N. C. Moitra, M.B., in the *Indian Medical Gazette*, October number, on the use of hydrogen peroxide in cholera, in which he says that he wrote a short note in the *Therapeutic Notes*

published by Parke, Davis and Co., but he gives no date as to when he had written this short note.

Also he does not say as to whether he uses liq. hydrogen peroxide B. P. (10 p.c.) or a preparation of higher or lower strength, etc.

Further, I beg to inform you that I had tried and then written an article on the use of liq. hydrogen peroxide B. P. in cholera cases independently, i.e., I had never heard or read that the drug was ever used for this disease by any one before my article was published in the *Hospital Assistant* for October and November, 1916, and in the *Indian Medical Journal* for September, 1917, giving full details as to the mode of administration, percentage of recovery, etc.

I hope Dr. Moitra will be kind enough to state the date and year when he had written his note in the *Therapeutic Notes* mentioned above, and also give full particulars about the use, etc., of the drug so that the profession may make use of it in the manner he has found the drug useful.

I had also sent my article to be published in the *Indian Medical Gazette* in September, 1916, and the then Editor of the *I. M. G.* had sent me a letter saying that the article would be published as soon as space was available, but I think the paper was probably missed and was not published in the *I. M. G.*

Yours, etc.,

DEVI SINGH GOUR,

Sub-Assistant Surgeon,

Morsi Dispensary.

AMRAOTI, C. P. :

October, 1919.

THE HEART ON THE RIGHT SIDE.

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR,—On the 20th of August last, while examining the chest of a tubercle patient for the first time, I was astonished to find I could not hear the heart sounds in their normal positions. I had started at the normal site of the apex, and had worked up to the sternal of the second space before I could hear any heart sound, and here it was barely audible. On crossing to the right of the sternum the sounds became audible.

Auscultation and percussion show that the heart is completely on the right side, and the liver is on the right side too. The right border of the sternum roughly marks the left side of the heart. The apex lies in the fifth intercostal space and is heard best about half an inch external to the mammary line on the right side.

This is the first time I have met a patient with his heart on the right side, and my note may interest your readers.

Yours, etc.,

J. G. S. FLEMING,

Civil Surgeon.

ALMORA, U. P. :

25th October, 1919.

FLYING INSECTS FROM THE RECTUM.

To the Editor of THE INDIAN MEDICAL GAZETTE.

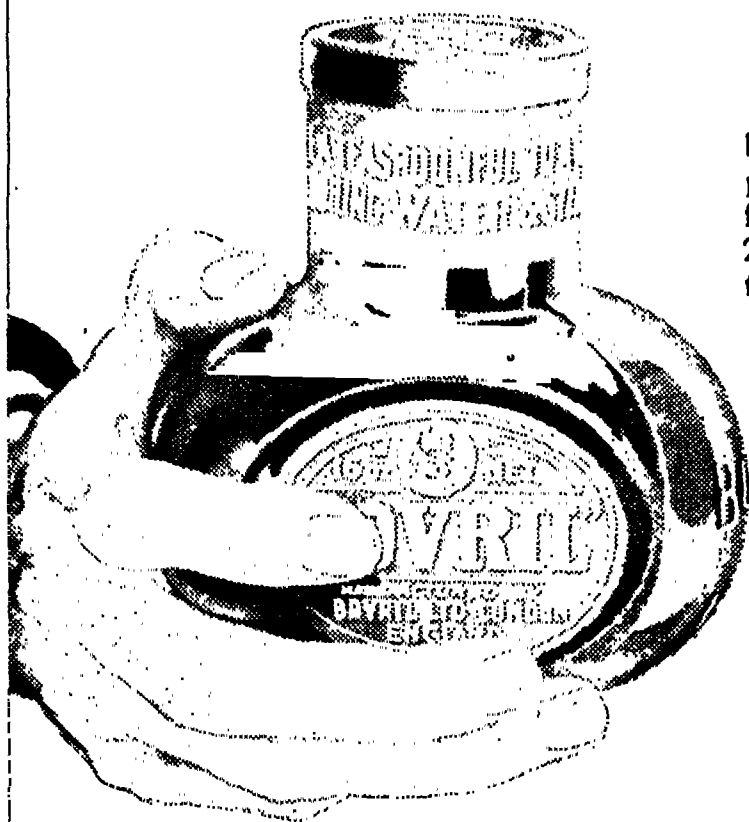
SIR,—With reference to the letter of Babu A. C. De, I.M.S., in the *Indian Medical Gazette* of August last, and that of Babu S. C. Sen, I.M.S., in the current issue, I feel myself interested to inform you of my experience, which may help to take further steps in the matter.

In the month of November, 1916, I found three cases here—one Bengali Babu (named Jadunath Sirkar, Hoolahat P. O., Bakerganj Dist.), aged about 40 years, and his two children, aged 6 and 4 years, respectively.

The flying insects were of the same quality as already reported by the above-mentioned gentlemen. It may give also some new light to the readers to know that the elderly man was then suffering from black-water fever and the children were living in the same room; and the insects came out, in each case, after the rectal saline injections.

I could not make any further notes on the subject as the family withdrew from the place immediately after.

For favour of further investigations Babu A. C. De and S. C. Sen are earnestly requested to take a little



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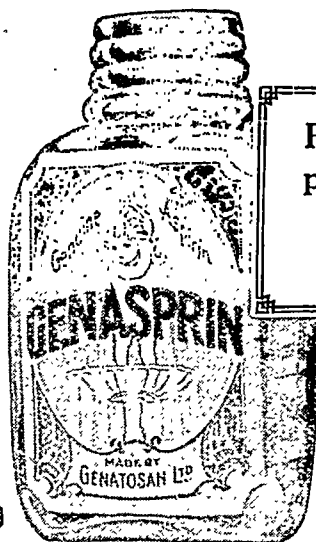
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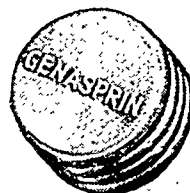
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Yours etc.,

T. N. CHAKRAVARTY,
Medical Practitioner,
Nagrakata P. O.,
Ghatia Tea Estate,
Jalpaiguri Dist.

GHATIA TEA ESTATE :
28th October, 1919.

Service Notes.

To be C. I. E.—Major Leonard Hirsch, I.M.S.; Lieut.-Col. John William Watson, I.M.S.; Lieut.-Col. John Bland Jameson, I.M.S.

To be C. B. E.—Major and Brevet Lieut.-Col. F. A. F. Barnardo, C.I.E., I.M.S.

To be O. B. E.—Capt. A. F. Babonau, M.B., I.M.S.; Major J. K. S. Fleming, I.M.S.; Major G. D. Franklin, M.B., I.M.S.; Major T. W. Minty, I.M.S.; Lieut.-Col. Paxton St. Clair More, M.B., I.M.S.; Major R. B. Nicholson, M.C., I.M.S.; Major H. W. Pierpoint, F.R.C.S., I.M.S.; Capt. C. H. Smith, I.M.S.; Capt. J. R. D. Webb, I.M.S.; T.-Capt. S. K. Engineer, I.M.S.

To be M. B. E.—Lieut. P. X. Godinho, I.M.S.

To be Brevet Major.—Capt. E. E. Doyle, I.M.S.; Capt. W. R. Stewart, M.B., I.M.S.

THE services of Major R. Kelsall, D. S. O., M.D., I.M.S., are placed permanently at the disposal of the Government of Burma, with effect from the 29th April, 1919.

MAJOR H. C. BROWN, C.I.E., M.B., I.M.S., Assistant Director, Central Research Institute, Kasauli, is granted privilege leave for six months combined with furlough for three months, with effect from the 20th October, 1919, or such subsequent date from which he may avail himself of the leave.

MAJOR S. R. CHRISTOPHERS, C.I.E., O.B.E., M.B., I.M.S., of the Bacteriological Department, is appointed Assistant Director, Central Research Institute, Kasauli, with effect from the date on which he takes charge of that office and until further orders.

THE King has approved the grant of the temporary rank of Lieutenant in the Indian Medical Service to the undermentioned gentleman :—

John Portelli, M.D., 3rd April, 1919.

CAPT. KHOIRHOY KANSJI PATEL, Indian Medical Service, is permitted, subject to His Majesty's approval, to resign his temporary commission, with effect from the 20th August, 1919.

TEMPORARY CAPT. RUDRA DATTA, Indian Medical Service, is permitted, subject to His Majesty's approval, to resign his temporary commission, with effect from the 8th September, 1919.

THE date of resignation of temporary Capt. Umedram Lalbhai Desai, Indian Medical Service, is the 18th April, 1919, and not as stated in Army Department Notification No. 2440, dated the 18th July, 1919.

MAJOR W. J. POWELL, Indian Medical Service, Staff Surgeon, 4th (Quetta) Division, is appointed to hold charge of the current duties of the office of the Civil Surgeon, Quetta, in addition to his own duties, with effect from the 17th August, 1919, and until further orders.

To be acting Major. Deputy Assistant Director of Medical Services.—Capt. J. C. Bharucha, Indian Medical Service. Dated 18th May, 1919.

Commanding No. 178 Indian Cavalry Field Ambulance.—Capt. John Alexander Sinton, V.C., M.B., from 25th February, 1918, to 18th April, 1918, and from 30th July, 1918, to 12th April, 1919.

HIS EXCELLENCY THE GOVERNOR OF BOMBAY IN COUNCIL is pleased to appoint Mr. V. S. Bhide, I.C.S., in addition to his own duties, to do duty as Superintendent of Máthérán, so far as the Civil administrative duties of the office are concerned, *vice* Lieut.-Col. M. P. Khareghat, I.M.S. (retired), pending further orders.

MAJOR R. H. BOTT, M.B., F.R.C.S., I.M.S., is appointed to be Professor of Surgery, King Edward Medical College, and First Surgeon to the Mayo Hospital, Lahore, substantively *pro tempore* with effect from the 20th August, 1919.

MAJ.-GEN. W. E. JENNINGS, Indian Medical Service, is appointed an Honorary Physician to the King, *vice* Maj.-Gen. R. W. S. Lyons, Indian Medical Service. 11th January, 1919.

MAJ.-GEN. W. H. B. ROBINSON, C.B., Indian Medical Service, is appointed an Honorary Surgeon to the King, *vice* Col. Hormasjee Edaljee Banatvala, C.S.I., Indian Medical Service. 22nd April, 1919.

MAJOR A. W. OVERBECK-WRIGHT, I. M. S., sub. *pro tem*. Superintendent, Lunatic Asylum, Agra, to be confirmed in his appointment.

LIEUT.-COL. W. H. E. WOODWRIGHT, I. M. S., officiating Inspector-General of Civil Hospitals, on being relieved, to revert as Civil Surgeon of Bareilly.

THE Governor in Council is pleased to appoint Lieut.-Col. F. O. N. Mell, C.I.E., M.B., I.M.S., to be Inspector-General of Prisons in the Bombay Presidency, relieving Col. H. E. Banatvala, C.S.I., I.M.S.

MAJOR G. G. HIRST, I.M.S., Deputy Medical Storekeeper to Government, Bombay, is granted privilege leave for 30 days, with effect from the 17th September, 1919.

To be acting Lieutenant-Colonel. Officer Commanding, Combined Casualty Clearing Station.—Capt. G. H. Mahoney, Indian Medical Service. Dated 16th April, 1919.

Officer Commanding, Combined Field Ambulances.

MAJOR A. N. DICKSON, M.C., Indian Medical Service. Dated 11th May, 1919.

THE Viceroy and Governor-General has been pleased to make the following appointment on His Excellency's Personal Staff, with effect from the 16th September, 1919.

To be Honorary Surgeon.

LIEUT.-COL. B. R. CHATTERTON, M.D., F.R.C.S.I., Indian Medical Service, *vice* Lieut.-Col. T. A. Granger, C.M.G., M.B., Indian Medical Service, whose tenure has expired.

TEMPORARY CAPT. HORMAZSHAW JAMSHEDJI WANIA is permitted, subject to His Majesty's approval, to resign his commission, with effect from the 19th August, 1919.

HONORARY TEMPORARY LIEUT. BHOPAL SINGH, Indian Medical Service, is permitted, subject to His Majesty's approval, to resign his commission, with effect from the 10th September, 1919.

THE date of resignation of temporary Capt. Raj Kishore Kacker, Indian Medical Service, is the 23rd August, 1919, and not as stated in Army Department Notification No. 2639, dated the 15th August, 1919.

THE following acting promotion is notified, subject to His Majesty's approval :—

Major William Jackson Powell, M.B., to be acting Lieut.-Col. while commanding No. 25 Combined Field Ambulance, from the 12th March, 1918, to the 17th May, 1918.

THE services of Major A. W. Overbeck-Wright, M.D., I.M.S., are placed permanently at the disposal of the Government of the United Provinces.

LIEUT.-COL. G. J. GRAFTON YOUNG, M.B., I.M.S., to act as Superintendent, Central Lunatic Asylum, Yerávdá, in

addition to his military duties, *vice* Major R. F. Steel, M.B., B.Ch. (Dub.), I.M.S., who is to resume the active duties of Superintendent of Mahábaleshvar, on 1st October, 1919.

LIEUT.-COL. M. P. KHAREGHAT, I. M. S., on being relieved of his appointment of Superintendent of Mátherán, to continue to act as Presidency Surgeon, Second District, Bombay, with attached duties.

LIEUT.-COL. CHARLES HARDWICK LOUW MEYER, M.D., Indian Medical Service (retired), whose re-employment was notified in Army Department Notification No. 997, dated the 1st September, 1916, has been permitted to resign, with effect from the 31st March, 1919.

MAJOR WILLIAM PERCIVAL GOULD WILLIAMS, M.B., Indian Medical Service, is appointed Deputy Medical Storekeeper to Government, as a temporary measure, with effect from the 31st August, 1919, *vice* Captain J. H. Smith, M.B., Indian Medical Service, vacated.

SUBJECT to His Majesty's approval, the services of temporary Captain Sorabji Fardunji Bisni are dispensed with, with effect from the 17th September, 1919.

COL. J. K. CLOSE, M.D., I.M.S., Officiating Surgeon-General with the Government of Bengal, is appointed to officiate as Inspector-General of Civil Hospitals, United Provinces, with effect from the date on which he assumes charge of his duties, until further orders.

LIEUT.-COL. SIR JAMES REID ROBERTS, Kt., C.I.E., M.B., F.R.C.S., Bengal, is permitted, subject to His Majesty's approval, to retire from the service, with effect from the 9th July, 1919.

SUBJECT to His Majesty's approval, the undermentioned to be temporary Lieutenants, with effect from the dates specified :—

- Annada Prasad Sinha, M.B. Dated 18th July, 1919.
- Nilkanth Vinayak Pandit, M.B. Dated 29th July, 1919.
- Bhupendra Nath Basu, M.B. Dated 9th August, 1919.
- Nripendra Kumar Bosu, M.B. Dated 9th August, 1919.
- Nagendra Nath Maitra, M.B. Dated 10th August, 1919.
- Ram Chand Mahajan, M.B. Dated 20th August, 1919.
- Louis Oswald, M.B. Dated 23rd August, 1919.
- Parmanand Harumal Jhangiani, M.B. Dated 26th August, 1919.
- Phanindra Mohan Lahiri, M.B. Dated 1st September, 1919.
- Tabla Ram Bimani, M.B. Dated 11th September, 1919.
- Manmahan Shammath Grutow, M.B. Dated 16th September, 1919.
- Jamsetji Ruttonji Mirza, M.B. Dated 19th September, 1919.
- Bala Prasad, M.B. Dated 19th September, 1919.
- Vaman Anant Belsare, M.B. Dated 9th August, 1919.
- Bhalchandra Gangadhar Marathe, M.B. Dated 20th August, 1919.
- Raghubansa Kishore Tandon, M.B. Dated 15th September, 1919.
- Bhairon Dayal, Dated 19th September, 1919.
- Herbert McKenzie Strickland, M.B. Dated 22nd September, 1919.
- Mangalore Gopal Kini. Dated 23rd September, 1919.

LIEUT.-COL. J. H. HUGO, D.S.O., Indian Medical Service (Bengal), an Agency Surgeon of the 1st Class, is posted as Chief Medical Officer, North-West Frontier Province, with effect from the 29th September, 1919.

LIEUT.-COL. H. BURDEN, C.I.E., Indian Medical Service (Bengal), an Agency Surgeon of the 1st Class, and Residency Surgeon and Chief Medical Officer in Baluchistan, is granted privilege leave for five months and ten days, combined with furlough for six months and twenty days, with effect from the 24th September, 1919, under Articles 233 and 308 (b) of the Civil Service Regulations.

DR. S. GASTER, Church Missionary Society, is appointed to officiate temporarily as an Agency Surgeon, 2nd Class, and is posted as Residency Surgeon and Chief Medical Officer in Baluchistan, with effect from the 24th September, 1919.

Notice.

SCIENTIFIC Articles and Notes of interest to the Profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if requested.

Communications on Editorial Matters, Articles, Letters and Books for Review should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements, and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscription to "*The Indian Medical Gazette*," Rs. 14, including postage, in India. Rs. 16, including postage, abroad.

BOOKS, REPORTS, &c., RECEIVED:—

- Publications of the South African Institute for Medical Research, No. XII, April 1919.
- Ceylon Administration Report, Medical, 1919.
- Handbook of Gynaecology. By Bethel Solomons, M.D. Messrs. Baillière, Tindall and Cox, Ltd., 1919.
- Manual of Anatomy. By A. M. Buchanan, M.D. 4th Edition. Messrs. Baillière, Tindall and Cox, Ltd., 1919.
- Annual Clinical Report, Government Maternity Hospital, Madras, 1918.
- Administration Report of City of Bombay, Vol. II, 1918.
- Sanitation, Dispensaries and Jails in Rajputana, 1918-19.
- Hospitals and Dispensaries, Bengal, 1918.
- Journal of Ceylon Branch of B. M. Association, Vol. XVI, Part II.
- Annual Returns of the Hospitals and Dispensaries in Behar and Orissa, 1918-19.
- Annual Returns (Statistical) and Notes on Vaccination, Behar and Orissa, 1918-19.
- Annual Sanitary Report, Behar and Orissa, 1918.
- Medical and Sanitary Reports : Hongkong, 1918.
- Annual Report of the Victoria Memorial Scholarship Fund, 1918.
- Administration Report of the Jails of Behar and Orissa, 1918.
- Publications of the South African Institute of Medical Research.
- Epidemic of Influenza, 1918. By I. C. Bhatt and K. M. Hiranandani. 2nd Edition, Hyderabad.
- Annual Report on the Department of Fisheries : Bengal, Behar and Orissa, 1919.
- Recent Advances in the Treatment of Syphilis. By Rajendra Kumar Sen. Messrs. Butterworth and Co., Calcutta, 1919.
- Elementary Organic Chemistry. By F. Pilkington Sergeant. 2nd Edition. Messrs. H. K. Lewis and Co., London, 1919.

LETTERS, COMMUNICATIONS, &c., RECEIVED FROM:—

A. J. Noronha, M.D., Hon. Physician, J. J. Hospital, Bombay; The Registrar, Bombay Medical Council; T. S. Ross, Lt.-Col., I.M.S., Calicut, Malabar, Madras; Major Salisbury, I.M.S., Bombay; Lt.-Col. Hassell-Wright, Coorg; Capt. P. Pant, I.M.S., Hardwar; Lt.-Col. Scroggie, C.I.E., I.M.S., Rawalpindi; The Secretary, College of Physicians, Edinburgh; The Secretary, Tropical Diseases Bureau; Sir Koilas Chunder Bose, Calcutta; T. S. Krishnamurti, Madras; C. Paparow, M.C.P. & S., Madras; Lt.-Col. E. E. Waters, I.M.S., Howrah; Capt. A. S. Fry, Army Headquarters, Simla; J. L. Fleming, Civil Surgeon, Almora, U. P.; Capt. T. C. Toyle, I.M.S., Ambala; Devi Singh Gour, Amaroti, C. P.; T. N. Chakravarty, Jalpaiguri, Bengal.

